

AMERICAN JOURNAL OF OPHTHALMOLOGY

Medical Lib.

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Copyright 1929, Ophthalmic Publishing Company, 7 West Madison Street, Chicago.

Subscription twelve dollars yearly. Single number, one dollar twenty-five cents.

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

PUBLICATION OFFICE: 450 AHNAP STREET, MENASHA, WISCONSIN

EXECUTIVE OFFICE: 7 WEST MADISON STREET, CHICAGO, ILLINOIS

EDITORIAL OFFICE: 530 METROPOLITAN BUILDING, DENVER, COLORADO

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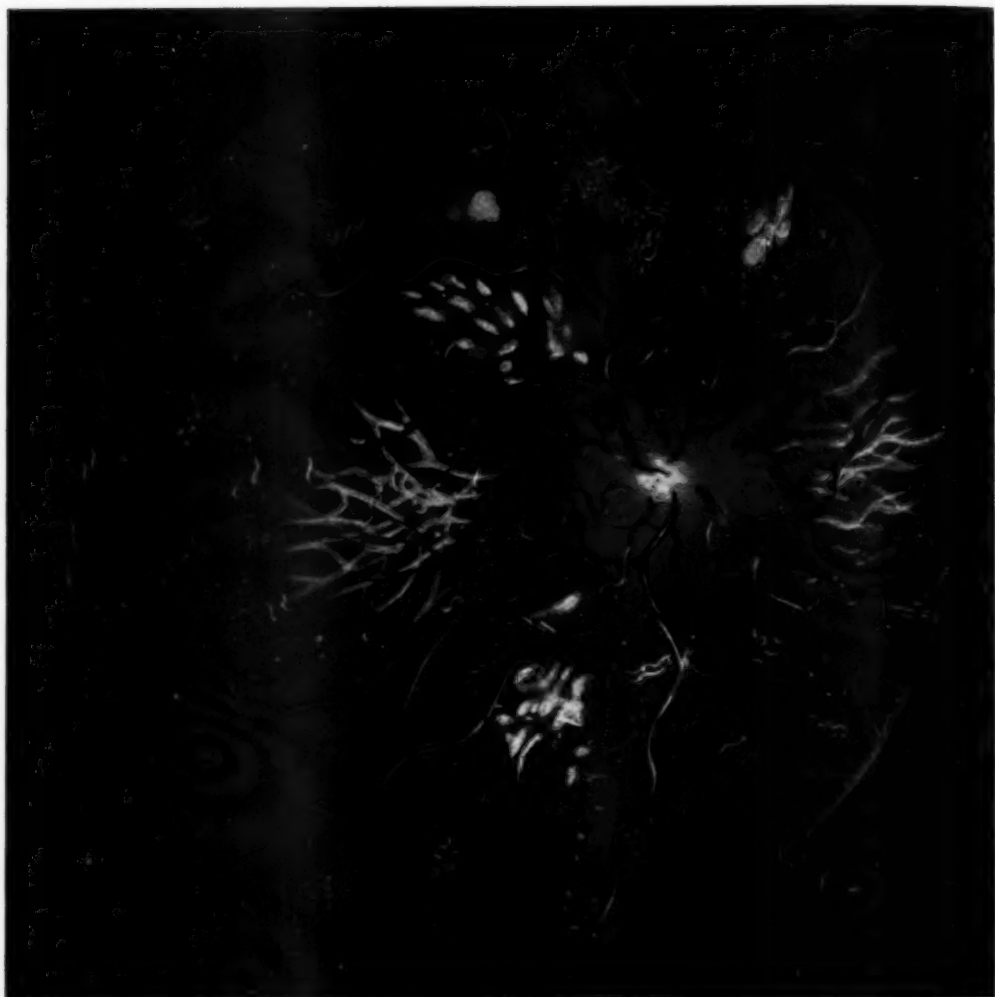
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VASCULAR DISTURBANCES IN RELATION TO GLAUCOMA (F. PHINIZY CALHOUN).

AMERICAN JOURNAL OF OPHTHALMOLOGY

Volume 12

April, 1929

Number 4

THE VASCULAR STATE AND GLAUCOMA

F. PHINIZY CALHOUN, M.D., F.A.C.S.

ATLANTA, GEORGIA

Of a series of sixty-four cases of glaucoma, ninety-five per cent were found to present vascular disease; and of the vascular cases fifteen per cent had syphilis, forty per cent had nephritis, forty-two per cent had abnormally high systolic pressure, fifty-seven per cent had an abnormally high diastolic pressure, and sixty per cent had dilatation of the heart or of the aorta. The author favors the belief that glaucoma may be due to disease in the vascular tunics of the eye. The accompanying color plate illustrates the observation that the higher ocular tension is not infrequently seen in the eye which has the more advanced vascular pathology in retina and choroid.

In some cases of glaucoma simplex, I have observed that in the eye with the higher tension and greater cupping the retinal arteries were more sclerosed and the choroid was more tessellated (with areas of apparent sclerosis) than in the opposite eye, which was nearly normal even in tension.* This observation led me to consider that possibly an angiosclerosis of the eye tunics might explain the origin of glaucoma, for I had interpreted that a tessellated choroid, when seen in glaucoma, was due to a

type of diffuse sclerosis of the choriocapillaris, and not a thinning of the pigment epithelium from pressure, the generally accepted view.

This idea, like some others concerning the origin of glaucoma, was abandoned, until Charlin presented his report before the Washington International Ophthalmological Congress in 1922, when my interest was renewed. It may be recalled that the title of his paper was "The vascular state of patients with glaucoma".

His conclusions, briefly summarized, were:

First, that ninety per cent of his cases showed general vascular symptoms.

Second, that syphilis was a dominant factor for this vascular change in the presenile age, while arteriosclerosis was present in cases over sixty years of age.

Third, that syphilis was almost always present in the glaucomatous subject under fifty years of age.

I decided therefore to conduct a similar investigation to satisfy my own curiosity and to serve for comparison with Charlin's figures. The investigation, which was conducted on sixty-four private patients (excluding the last eleven) was solely done to determine the cardiovascular state in patients who had glaucoma simplex.

*The accompanying colored drawing strikingly illustrates the contention made in the paper that the higher intraocular tension is often observed in the eye with the more advanced pathology in the vessels of the retina and choroid.

The patient, not included in the series, was a woman aged forty-nine years, whose right eye had been bad since a toxic pregnancy fourteen years previously. The left eye has always been good.

Vision right = 0, left = 20/20. Tension, right 40, left 25 mm. Hg (Schiotz).

Fundus: Right, secondary optic atrophy; advanced angiopathy of retinal vessels, with areas of marked sclerosis in a tessellated choroid; numerous hemorrhages and exudates, many undergoing cholesterol degeneration: Left, disc normal; arteries moderately sclerosed.

A general medical survey showed advanced cardiorenal vascular disease, evidenced by a blood pressure of 182/122, altered blood chemistry and urine, and low renal function.

Table 1

Case no.	Sex	Age	Familial glaucoma	Retinal vessel sclerosis	Blood pressure	Albumen	urine	Casts	Diagnosis and remarks
1	M	61	-	-	132/96	-	-	-	Pulmonary fibrosis; arteriosclerosis; dilated aorta; chr. tonsillitis
2	M	50	-	-	142/86	-	-	-	Arteriosclerosis; dilated heart and aorta; chr. tonsillitis
3	M	53	-	+	134/86	-	-	-	Oral sepsis; chr. prostatitis
4	M	42	-	-	134/82	-	-	-	Oral sepsis; slightly dilated heart and aorta
5	+	48	-	?	124/88	+	+	-	Oral sepsis; arteriosclerosis
6	+	65	-	+	142/78	+	+	+	Arteriosclerosis; chr. nephritis; cystic goiter; chr. tonsillitis
7	M	65	-	-	140/94	+	+	+	Chr. nephritis; arteriosclerosis; dilated heart and aorta; chr. tonsillitis
8	+	59	?	?	160/96	+	+	-	Hypertension; arteriosclerosis; slightly dilated heart
9	M	70	-	++	168/88	+	+	-	Arteriosclerosis; hypertension; atheroma
10	+	73	-	+	158/80	-	+	+	Arteriosclerosis; cardiac hypertrophy; chr. nephritis
11	+	62	?	++	170/100	+	+	-	Arteriosclerosis; dilated heart and aorta; chr. cholecystitis
12	+	53	-	++	200/110	-	-	-	Gumma of liver; hypertension; cardiac hypertrophy; syphilis
13	+	64	-	+	192/94	+	+	+	Arteriosclerosis; hypertension; chr. nephritis
14	+	52	+	+	152/98	+	+	-	Arteriosclerosis; hypertension; chr. tonsillitis
15	+	30	-	-	138/94	-	-	-	Migraine; arthritis; hypertension
16	M	39	?	-	128/78	-	-	-	Oral sepsis
17	M	62	-	-	154/90	+	+	-	Arteriosclerosis; hypertension
18	M	76	-	-	142/88	+	+	-	Chr. nephritis; t. b. fibrosis
19	+	73	-	+	146/71	+	+	+	Chr. nephritis; arteriosclerosis
20	+	54	-	-	150/90	+	+	+	Chr. nephritis; arteriosclerosis; oral sepsis
21	M	68	-	++	160/100	+	+	+	Chr. nephritis; hypertension; arteriosclerosis
22	M	60	?	+	95/60	-	-	-	Atheroma
23	+	68	-	+	180/80	-	-	-	Chr. cholecystitis; dilated heart and aorta; syphilis
24	+	43	++	+	120/70	-	-	-	Arteriosclerosis; endocrine imbalance
25	M	53	-	+	138/94	+	+	+	Chr. nephritis; arteriosclerosis
26	M	65	-	+	170/90	-	-	-	Chr. pulmonary t. b. arteriosclerosis
27	M	72	-	+	125/76	-	+	+	Chr. nephritis; cardiac hypertrophy; dilated aorta; arteriosclerosis
28	+	57	+	+	162/100	-	+	+	Arteriosclerosis
29	+	68	-	+	180/80	-	-	-	Arteriosclerosis; abdominal tumor (?)
30	+	53	+	-	170/100	-	-	-	Arteriosclerosis; systolic murmur
31	M	68	?	+	145/85	-	-	-	Arteriosclerosis; emphysema
32	+	51	-	-	134/80	-	-	-	Dilated heart and aorta
33	M	62	?	?	130/96	+	+	+	Diabetes
34	M	68	?	+	120/75	-	-	-	Slightly dilated heart and aorta; syphilis
35	M	72	0	++	0	+	+	-	Chr. nephritis; arteriosclerosis
36	+	61	++	?	130/90	+	+	-	Chr. nephritis
37	M	71	-	+	160/92	+	+	-	Chr. nephritis; arteriosclerosis
38	M	75	+	?	146/76	-	-	-	"Negative"
39	M	52	++	-	148/80	-	-	-	Morphine addict; dilated heart and aorta
40	+	66	-	+	140/90	-	-	-	Arteriosclerosis
41	+	44	-	++	142/76	-	-	-	Arteriosclerosis
42	M	64	-	0	180/70	-	-	-	Hypertension
43	M	63	++	+	184/106	+	+	+	Hypertension; chr. nephritis; arteriosclerosis
44	M	66	-	?	152/78	-	-	-	Oral sepsis; slightly dilated heart; systolic murmur
45	M	66	-	+	160/110	+	+	+	Chr. nephritis; arteriosclerosis; died
46	+	60	-	-	150/90	-	-	-	Cancer of colon; died
47	+	69	-	++	175/110	-	-	-	Chr. nephritis; arteriosclerosis
48	M	52	-	?	0	+	+	+	Chr. nephritis; arteriosclerosis; cerebral apoplexy; died
49	M	46	-	-	144/84	+	+	+	Chr. nephritis; arteriosclerosis

Case no.	Sex	Age	Familial glaucoma	Retinal vessel sclerosis	Blood pressure	Albumen urine	Casts	Diagnosis and remarks
50	+	66	-	+	150/100	+	+	Chr. nephritis; arteriosclerosis
51	M	56	-	+	0	0	+	Cerebrospinal lues; chr. nephritis; arteriosclerosis; died
52	+	71	-	+	160/90	-	+	Arteriosclerosis; syphilis
53	+	66	-	+	172/92	-	-	Arteriosclerosis
54	M	70	-	?	138/70	-	-	Oral sepsis; hypertrophied prostate; mitral murmur
55	M	70	-	+	0	-	-	Syphilis; mitral murmur
56	M	50	-	0	182/135	-	-	Hypertension; chr. nephritis
57	+	53	-	-	150/80	+	-	Chr. nephritis
58	M	56	0	+	120/90	-	-	Arteriosclerosis
59	+	58	-	+	140/100	-	-	Arteriosclerosis
60	M	41	-	+	168/100	+	-	Arteriosclerosis
61	+	70	-	+	165/90	0	0	Adenitis; aortitis (?); syphilis
62	M	45	-	-	130/90	-	-	Arteriosclerosis
63	M	37	+	-	124/60	-	-	Chr. iritis; aortitis; syphilis
64	M	60	-	++	150/100	+	-	General arteriosclerosis; chr. nephritis

The examination began with a very careful history, with especial attention to the vascular state of the patient, his immediate family, and his antecedents. Likewise each woman patient was closely questioned as to her past history in regard to pregnancies, miscarriages, and so on; and each man patient along similar lines regarding his wife's history. The examination included an estimate of the systolic and diastolic blood pressures, a urinalysis, often a functional kidney test, a Wassermann test of the blood (frequently of the spinal fluid), and in most instances the blood chemistry and an x-ray examination of the heart and aorta.

As to age of these sixty-four glaucomatous patients, three were in the third decade, seven in the fourth, eighteen in the fifth, twenty-five in the sixth, and twelve in the seventh.

A hereditary tendency to glaucoma was conspicuously noted in the histories of ten cases, and was doubtful in six others. From the examination of the sixty-four patients there was very definite evidence of vascular disease in sixty-one cases, but this was not detected in the remaining three cases.

In these sixty-one vascular cases, there was an associated nephritis twenty-four times, and nine were regarded as syphilitic, while in the remaining twenty-eight cases neither nephritis nor syphilis was detected.

In fifty-five cases an x-ray examination of the heart and aorta was made. One or both were found dilated thirty-three times (heart twenty-four, aorta twenty-six). There were two definite cases of aortitis, and nine others were marked "suggestive". Valvular heart lesions, not here classified, were found in five cases.

The blood pressure was taken in all cases. An abnormally high systolic pressure (above 160 mm.) was present in twenty-five cases, and a diastolic pressure above 90 mm. in thirty-four cases.

In determining whether a patient was syphilitic, not only was there considered the Wassermann test of the blood and in a few instances of the spinal fluid, but also the admissions of infections and the histories of the female patients and of the wives of male patients as to miscarriages and still births. No provocative tests were made.

It was thought that syphilis was present in nine cases, but only three gave strongly positive Wassermann reactions. Three of these nine cases occurred among the group of eleven negro clinical patients. With one exception the age of these nine syphilitic patients was over fifty-three years, and all nine showed evidence of marked vascular disease. Of these cases marked "negative", which was intended to mean that there was no definite evidence of cardiovascular disease or syphilis, the following positive findings are recorded:

Case 16, aged 39 years, "mother blind", oral sepsis, over weight.

Case 18, aged 76 years, chronic pulmonary tuberculous fibrosis, trace of albumen, low kidney function (25 per cent).

Case 46, aged 60 years, cancer of colon, died.

Two of these cases may be regarded as early cardionephritics, although they were not included in the totals.

Analyzing the ages in which these diseases were most frequent, one finds that of the ten cases in the third and fourth decades nine had vascular disease, two of which had syphilis, one nephritis, and one was negative.

Of the eighteen cases in the fifth decade, all gave evidence of vascular disease; one of these had syphilis, six nephritis, and one both syphilis and nephritis.

In the senile period (over sixty years), comprising thirty-six cases, vascular disease was present in thirty-four cases, five of which had syphilis, sixteen nephritis, and two were negative.

A chemical examination of the blood and a functional test of the kidneys was made in most cases. The information gained, in spite of a few discrepancies which are noted in the reports, was of no special value, except that it acted as a check or as confirmatory evidence of other pathological findings which suggested an early nephritis.

A summary of the more important findings shows that

- (1) Vascular disease was present in ninety-five per cent of the cases. (Charlin ninety per cent.)
- (2) Syphilis was present in fifteen per cent of the vascular cases, and in fourteen per cent of all cases. (Charlin fifty-seven per cent.)
- (3) Nephritis was present in forty per cent of the vascular cases, and in thirty-seven per cent of all cases.
- (4) An abnormally high systolic pressure was found in forty-two per cent. (Charlin sixty-two per cent.)
- (5) Abnormally high diastolic pressure was found in fifty-seven per cent.
- (6) Dilatation of the heart or aorta was found in sixty per cent. (Charlin fifty-nine per cent.)

Table 2

	Total	Vascular disease	Syphilis	Nephritis	Negative
3rd and 4th Decades..	10	9	2	1	1
5th Decade	18	18	1+1*	6+1*	0
6th and 7th Decades..	36	34	5	16	2
Total....	64	61	9	24	3

*One patient has syphilis and nephritis.

The small percentage of syphilis in this series (fifteen per cent) as compared with Charlin's (fifty-seven per cent) may be due to the fact that eighty-three per cent of the patients were private cases and represented a higher social status (eleven clinical patients excepted).

From a critical examination of this and other similar reports, one seems justified in concluding that cardiovascular disease is closely allied with glaucoma, and, while no claim is made that vascular disease (local or general) is the primary etiological factor of glaucoma, it is a temptation

at least to suggest that in the cycle of development of cardiovascular disease (hypertension, cardiac hypertrophy, vessel degeneration, renal impairment, and altered blood chemistry) there may occur in the vascular tunics of the eye, particularly the choroid, certain mechanical or chemical changes which can produce an elevation of intraocular tension. This thought, long considered, seems to be attracting attention, for Maitland Ramsey believes that glaucoma and glomerulonephritis are both due to a toxin which produces dilatation of the capillaries and increased permeability of the capillary wall. Paramore like-

wise sees this same analogy, but considers that, instead of a capillary dilatation, the factor is an increase in the intraocular capillary pressure, which is the result of a chemical change.

As our limited knowledge of hypertension and its associated vascular disorders increases, I have faith that other deductions will follow concerning the origin of glaucoma simplex.

I wish to acknowledge the assistance of my colleague, Dr. James E. Paullin, in the preparation of this report.

478 Peachtree street, N.E.

STUDIES IN PERIMETRY: 2. PRELIMINARY WORK ON A DIAGNOSTIC SCALE FOR THE COLOR FIELDS

C. E. FERREE and G. RAND*

and

M. M. MONROE†

BALTIMORE

A previous paper had plotted the range of variation of the form field for two hundred nonpathologic cases, classified as emmetropic, myopic, hyperopic, presbyopic, and astigmatic, at ages from eight to fifty-five years. The present paper undertakes to provide a similar determination of standard variations for the color fields, studied in 126 cases. Reasons are given to explain why the color fields show a greater range of variation than the form field. For the color fields the average breadth of field was considerably less in the clinic than in the laboratory study, and the range was considerably greater.

Introduction

The diagnosis of a pathologic condition in the presence of variables which are not pathologic necessitates one of two procedures: (a) the influence of the nonpathologic factors must be eliminated; or (b) a scale must be formed showing the normal range of variation of results under the influence of these factors. The determination of the color fields is influenced by many factors which are not pathologic. These may be divided into two classes: those pertaining to a given eye and those which differ from individual to individual. Among those of the former class the follow-

ing may be mentioned: wave-length and purity of stimulus, intensity of stimulus, size of stimulus or angle subtended at the eye, length of exposure to stimulus, method of exposure (moving or stationary stimulus), intensity of general illumination of the retina and the state of adaptation, breadth of pupil, and brightness of preexposure and of background or surrounding field. To these may be added also method of approach of the limit (ascending or descending series) and method of judging the limit for colors which change in hue in passing to the periphery of the field, e.g., red and green.

Methods and devices have been provided for the control of these factors with a high degree of precision. The study of the course of a pathologic condition in a given eye

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can thus be made with a satisfactory degree of certainty. Many factors of the second group, however, are in all probability not amenable to control by any means feasible for application in practical work. In dealing with these factors we are forced, therefore, to adopt the latter and less satis-

thus know what range of variation to expect from nonpathologic myopes, hyperopes, or presbyopes, observers falling within a certain range of central color sensitivity, and so on.

The effect of variable factors is, of course, to extend the normal range of variation and to render the use of

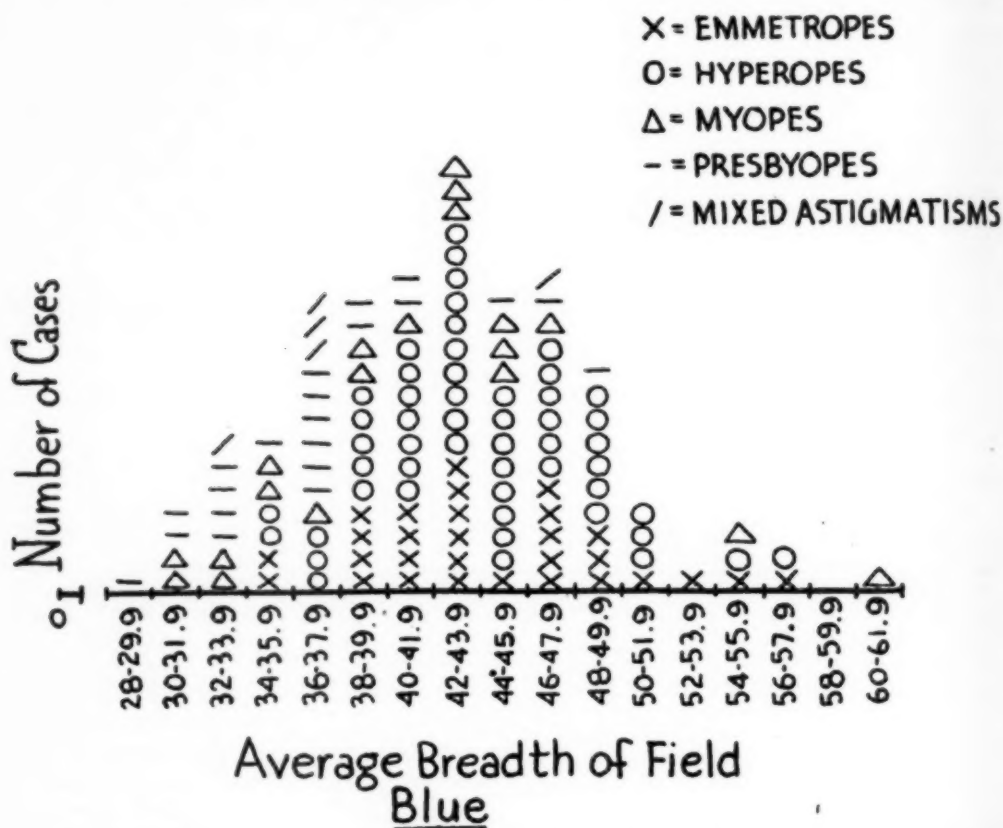


Fig. 1 (Ferree, Rand, and Monroe). Average breadth of field for the blue stimulus; showing the distribution for 126 nonpathological cases. The observers for this and the two following charts were selected to include cases of emmetropia, hyperopia, myopia, presbyopia, and mixed astigmatism. The distribution is based on the average breadth of field in the eight principal meridians. Average breadth of field in degrees is plotted on the horizontal coordinate, and number of cases on the vertical coordinate.

factory of the two procedures referred to above. That is, a scale must be formed showing a typical distribution of results for nonpathologic cases, under the influence of the factors that can not be controlled. In forming such a scale it is very desirable also that the results be classified and grouped with reference to as many factors as possible separately. We

differences in size of field less sensitive and less certain as a means of diagnosing incipient and borderline cases. A special study is being made of these effects and a great deal of valuable information has already been obtained. Among the measurable factors the effects of which are being studied may be mentioned curvature of cornea, breadth of pupil, the

peripheral refractive conditions, and peripheral acuity. Although there is little reason to expect that change of size of field can ever be made as sensitive and satisfactory a means of diagnosis as change of shape, still it is our hope that important improvements may be made, particularly for

ametropes should be a valuable aid in determining the true borderline and in making the subjective method of examination a more independent and serviceable factor in diagnosis. Provision has been made for this in the work that is reported in this series of papers.

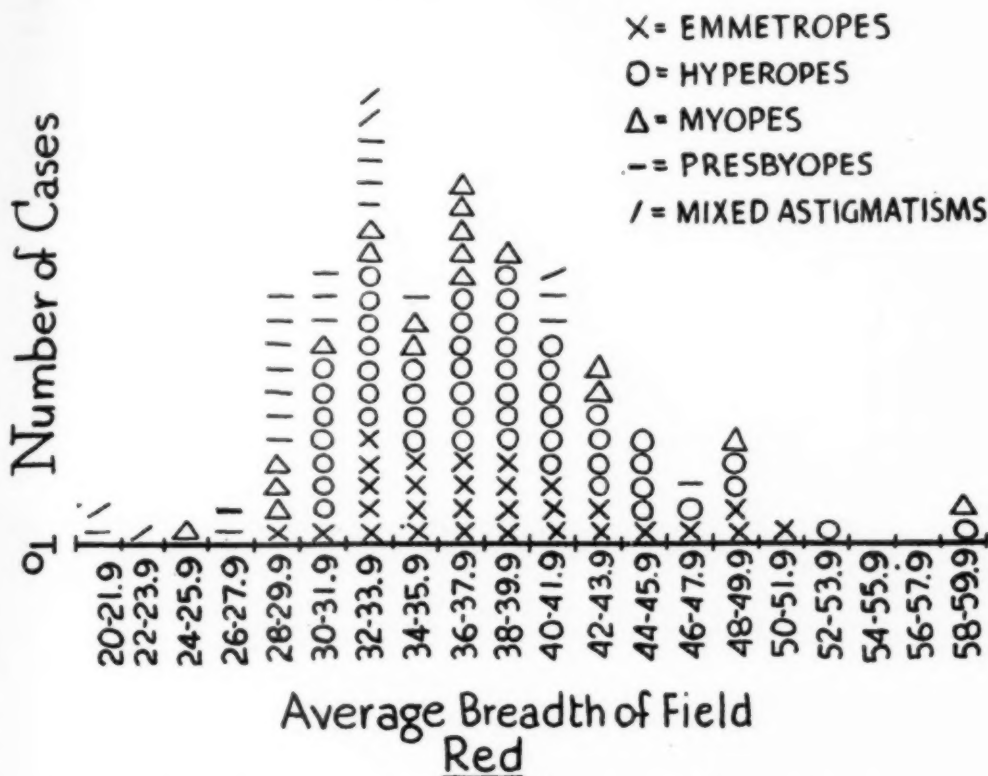


Fig. 2 (Ferree, Rand, and Monroe). Average breadth of field for the red stimulus; showing the distribution for 126 nonpathological cases.

the sake of those pathologic conditions in which change of shape is not a prominent feature.

An important need in establishing the borderline between pathologic and nonpathologic fields is that a careful record be kept of the cases examined in order that follow-up work may be done. If the borderline between what is pathologic and what is normal is to be decided entirely by the results of objective examination, a limit is placed on the sensitivity and usefulness of the subjective method. Careful follow-up work on the cases ex-

Conditions under which the fields were taken

In the first paper of this series¹ data were presented showing the range of variation of the form field for two hundred nonpathologic cases when a white stimulus subtending a visual angle of one degree was used and the illumination was kept constant at seven foot-candles at every

¹Studies in perimetry: I, Preliminary work on a diagnostic scale for the form field. Amer. Jour. Ophth., 1926, v. 9, 95-104.

point in the field. In this work a careful control was exercised over all of the external factors affecting the results of the determinations. With reference to the factors which influence the results from individual to individual, however, the selection of cases with two important exceptions, age and condition of refraction, was left entirely to chance. This was done because of the lack of definite

an inspection of these graphs can be determined, therefore, the widest, narrowest, and average field for all or any of the five classes of observers used and the size of field that should be regarded as borderline or suspicious.

It was the purpose of the present study to make the same type of determination for the color fields as was made in the previous study for the

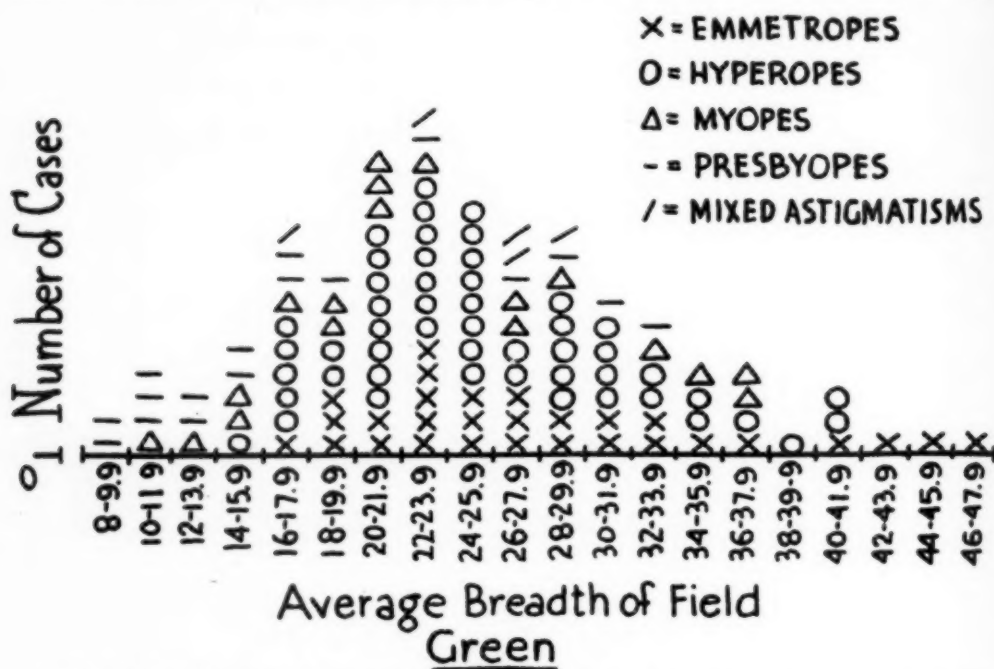


Fig. 3 (Ferree, Rand, and Monroe). Average breadth of field for the green stimulus; showing the distribution for 119 nonpathological cases.

knowledge of their relative importance. In the group of observers used were included cases of emmetropia, myopia, hyperopia, presbyopia, and astigmatism. The range of age was from eight to fifty-five years. For convenience of comparison an index had to be chosen to represent size of field. Two types of index were used: the average breadth of field in the eight principal meridians, and the area of the field, mapped on a scale of 12 mm. to 10°, measured with a planimeter. The results obtained were plotted in the form of graphs showing the frequency distribution of cases around a mid or median value. From

form field, using the same observers. For various reasons, however, only 126 of these observers could be used. The determinations were made with the Ferree-Rand perimeter. The stimuli employed were the standard red, green and blue of the Heidelberg series of pigment papers. From the standpoint of hue, saturation, coefficient of reflection, composition of light reflected, and durability these pigments were selected as the most suitable for clinic work of any that are now available for extensive use. The size of the stimulus was such as to subtend an angle of one degree at the eye of the observer. The pre-

exposure and surrounding field were in each case made as nearly as possible equal in brightness to the color at the limits of sensitivity. For this purpose the perimeter used is provided with preexposure and stimulus screens of a suitable coefficient of re-

As has been demonstrated in former papers, it is very important in the determination of the color fields to have a constant illumination of the stimulus and no difference in brightness between it and the surfaces which serve as preexposure and sur-

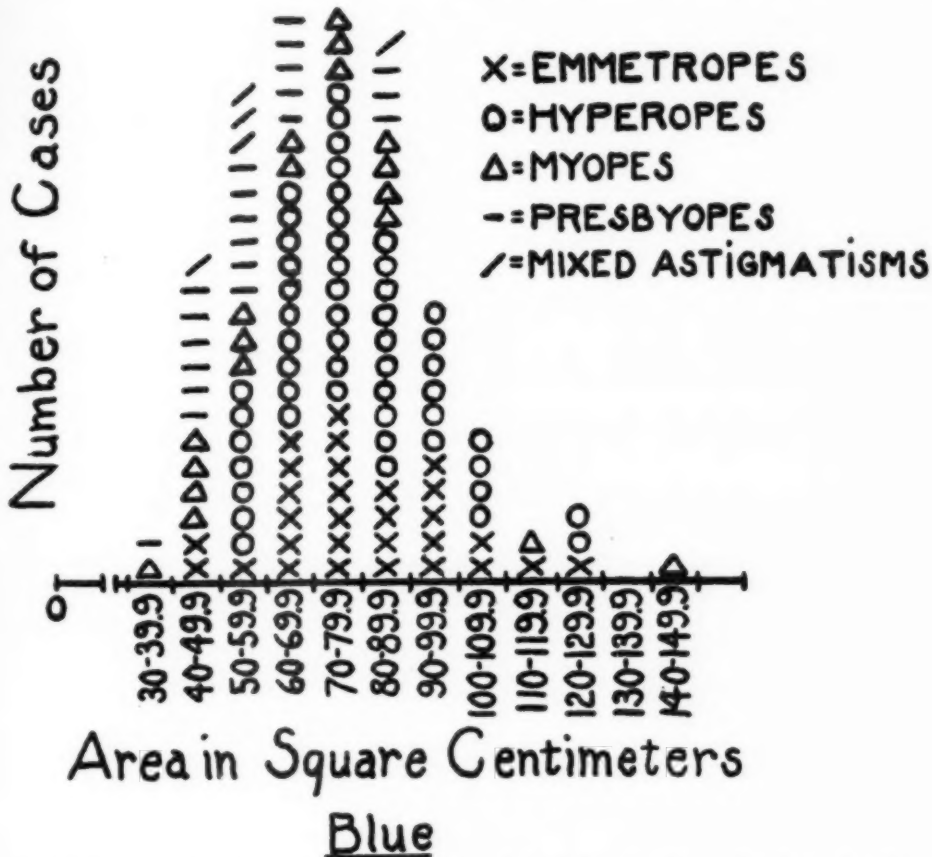


Fig. 4 (Ferree, Rand, and Monroe). Area of field for the blue stimulus; showing the distribution for 126 nonpathological cases. The observers for this and the two following charts were selected to include cases of emmetropia, hyperopia, myopia, presbyopia, and mixed astigmatism. The distribution is based on the area of field as measured with a planimeter from maps drawn to a scale of one degree to 1.2 mm. Area of field is plotted on the horizontal coordinate, and number of cases on the vertical coordinate.

flection. The value of this coefficient for the screens prepared for the blue and red stimuli is 11.4 per cent and for the green stimulus 39.5 per cent. The brightnesses of these screens when illuminated with seven foot-candles of light are respectively 0.00177 candle power per square inch and 0.00613 candle power per square inch.

rounding field. This latter control, it will be remembered, accomplishes two purposes: (a) It eliminates all variable effects due to brightness after-image and to brightness induction from the surrounding field on the power of the retina to respond to color; and (b) it renders the judgment of the limit more certain and easier to make, since at the limit of

sensitivity the stimulus becomes indistinguishable from the background when the background is of the same brightness as the color. The determi-

nations were made in the eight principal meridians (0, 45, 90, 135, 180, 225, 270, and 315 degrees)*. Ample rest periods were allowed between ob-

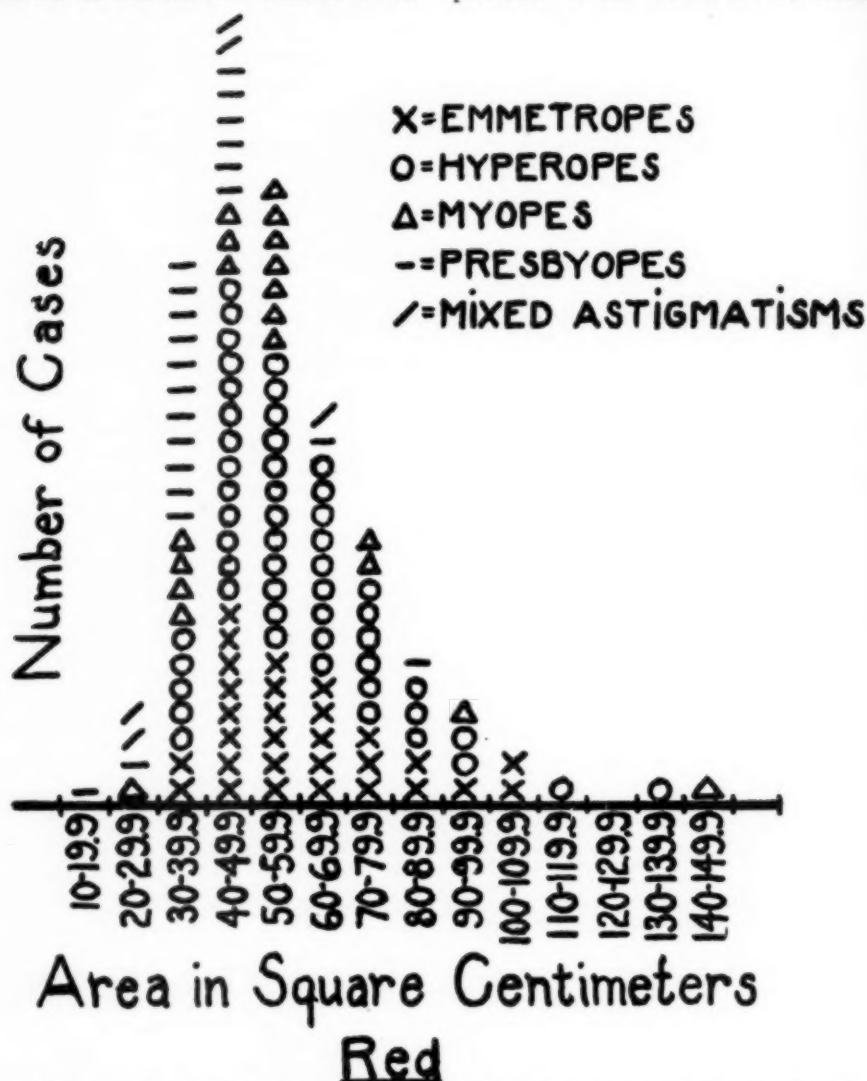


Fig. 5 (Ferree, Rand, and Monroe). Area of field for the red stimulus; showing the distribution for 119 nonpathological cases.

* As in former papers, the term meridian is used here for the quadrant of the meridian. While it is not necessary in refraction to treat the two anterior quadrants of the meridian separately, there is need for the separate treatment in perimetry.

Since the situation and needs in perimetry and refraction are so different, there seems intrinsically to be no good reason why the same designation should be used in the two cases. It might be advisable and convenient in perimetry to adopt the term quadrant and to number the quadrants for the right eye counterclockwise from 0, right horizontal, to but not including 360 degrees; and for the left eye clockwise from 0, left horizontal, to but not including 360 degrees. By this method the quadrant designations would correspond throughout for the two eyes, i.e., 45 degrees would represent upper temporal, 135 degrees upper nasal, and so on, for both eyes; but two sets of maps would be required, one for the right eye and one for the left. Similarly two concentric sets of graduations would be needed on the dial of the perimeter, one numbered clockwise for the right eye, the other counterclockwise for the left eye.

servations. Each determination was carefully checked, but the observers were not given extensive preliminary training. Care was taken not to include in the series the results of any observer showing a pathologic condition by objective examination. The observers were required also to pass the Ishihara test for color-blindness.

The results obtained may be considered to represent a fair sample of the color fields that may be expected from an average group of untrained observers showing no pathology, when the work is done under the conditions described above. These conditions, with regard to number of meridians selected, the preliminary training of the observer, the time consumed in making the examination, and so on, were intended more nearly to approximate those of the clinic than of the laboratory. Whether this was wise or not remains yet to be seen. The range of variation of fields obtained under such conditions of examination is not in all respects encouraging. How much of this is due to the attempt to conform to certain aspects of clinic condition and how much of it could have been avoided by a more careful and time-consuming examination can not be determined at this time.

The following reasons may be given for the greater range of variation of the color fields than of the form field:

(1) The color fields demand a much more careful method of working than the form field. The success of the examination is also much more dependent on the intelligence of the observer, the instructions received, and the amount of preliminary training and practice that is given. Practice in making the judgment of color is without question a very important factor. The results are more dependent too on the skill and experience of the operator and his intelligent understanding of the characteristics of the chromatic response of the peripheral retina and the factors by which

it is influenced. The difference between the methodologic problem set by the two types of determination can not be too strongly emphasized at this point.

(2) The color fields are much more sensitive to conditions which may influence the results, both pathologic and nonpathologic, than the form fields. This superior sensitivity gives them much greater possibilities as a means of diagnosis and investigation, but it also makes them more difficult to use. A sensitive instrument, for example, because of its sensitivity, is apt to be erratic. The satisfactory use of such an instrument in the hands of a novice is impossible. When used by a skilled operator, however, and properly protected from the influence of extraneous factors, it has an advantage and degree of usefulness in direct proportion to its sensitivity.

(3) The color fields are more subject to variation due to individual differences than the form field. All of the factors which differ from individual to individual have in general more effect on the color fields than on the form field because of the difference in sensitivity just noted. In addition there are greater individual differences in chromatic than achromatic sensitivity and greater deviations in its irregularity of distribution over the retina. Central color sensitivity has been found to sustain such an important relation to breadth of field in the nonpathologic eye that it may well be that the diagnostic scale should be formed and used in conjunction with tests for central sensitivity. That is, by means of the two scales determined for the same observers, one showing the normal range and distribution of breadth of field, we should have not only a two-fold check on diagnosis, but a scale of relations, disturbances of which might have an important diagnostic significance. The relative amounts of effect on central and peripheral sensitivity may, for example, prove

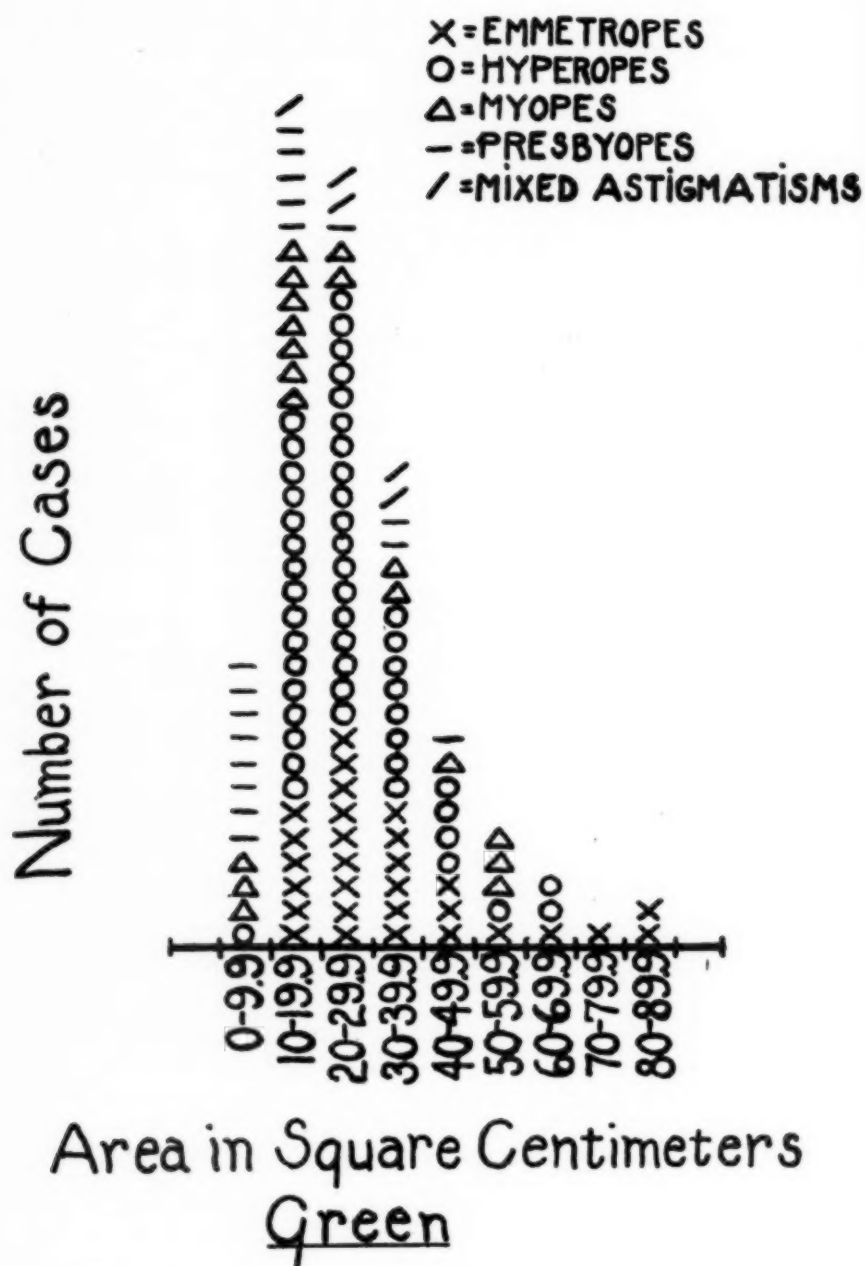


Fig. 6 (Ferree, Rand, and Monroe). Area of field for the green stimulus; showing the distribution for 119 nonpathological cases.

to be an important aid in differentiating between health and disease and between the various pathologic conditions.

(4) The use of a small stimulus increases the sensitivity of the peri-

pecting a greater scatter of results for a one degree color than for a one degree form stimulus. It may yet be found to be of advantage in the case of color to use a larger stimulus (e.g., two degrees) for diagnostic work

BLUE

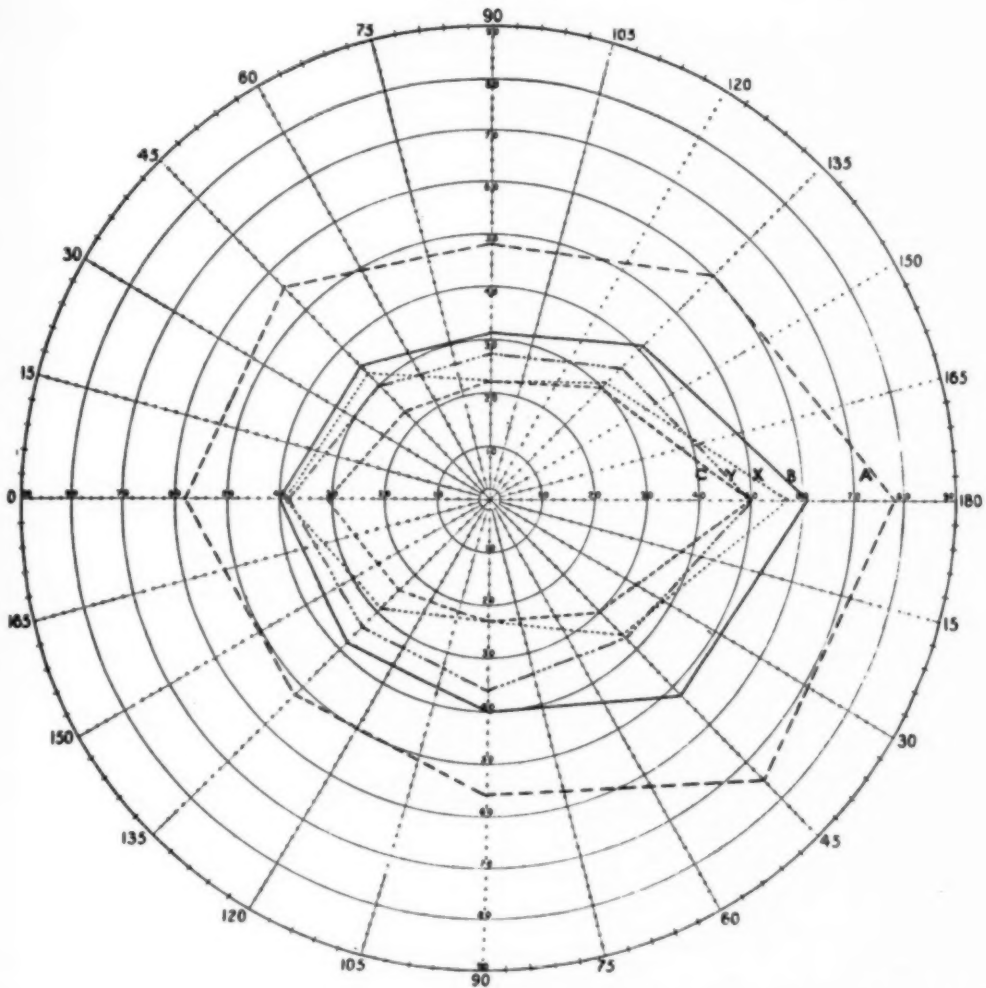


Fig. 7 (Ferree, Rand, and Monroe). Fields for blue; showing the widest field, A, for 126 nonpathological cases; the average field, B; the narrowest field, C; and the sizes of field which may be regarded as borderline, X for myopes and presbyopes, Y for emmetropes and hyperopes.

metric method more for the color than for the form stimulus. Proportionally greater facility is thus given to color perimetry for picking up differences between observers. This furnishes an additional reason for ex-

based on size of field and to employ small stimuli and other devices for increasing sensitivity only for the detection of scotomata, regional cuts, and so on, and for checking up the advance and recession of a pathologi-

cal condition, in which cases the increased sensitivity entails no compensating handicaps.

It is obvious that much has yet to be done for color perimetry before it

study can be made of the factors which differ from individual to individual, and in part by way of admonition to show what may be expected as to the normal range of var-

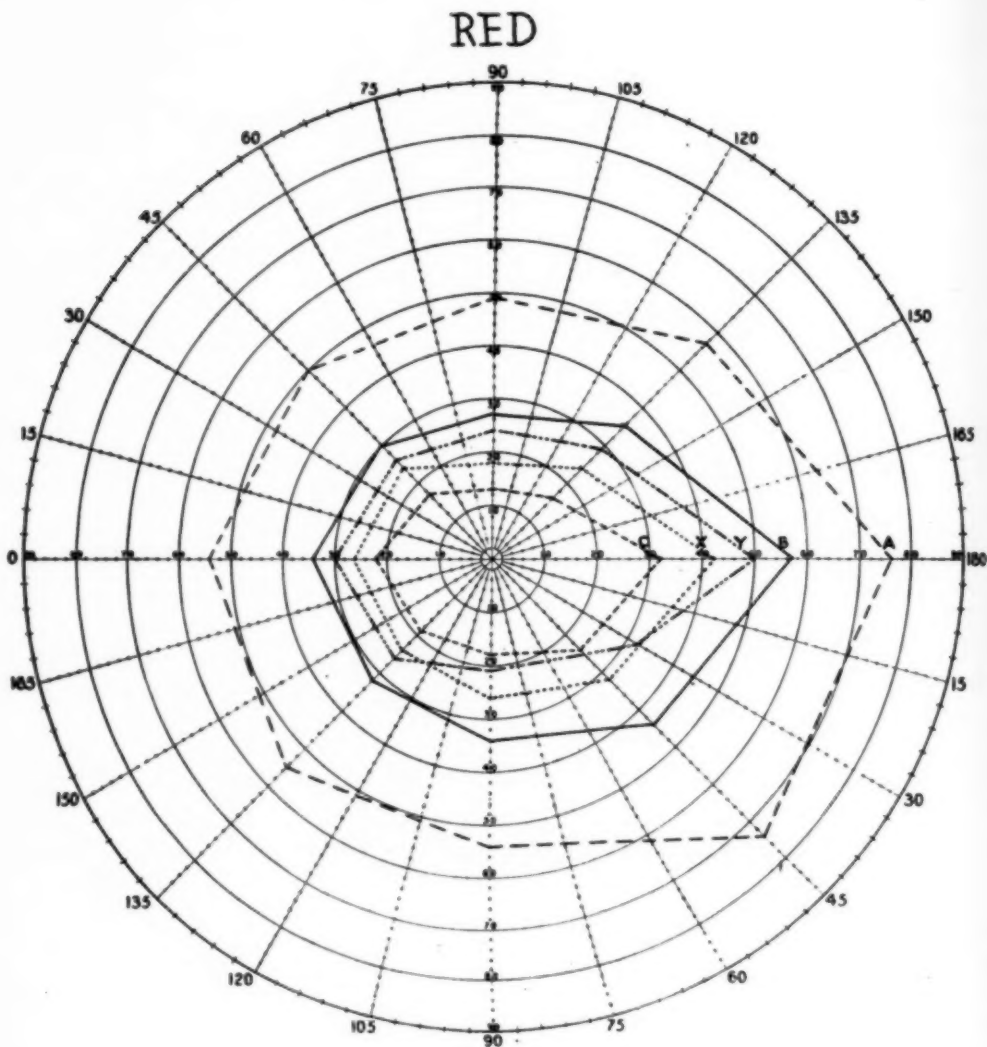


Fig. 8 (Ferree, Rand, and Monroe). Fields for red; showing the widest field, A, for 126 nonpathological cases; the average field, B; the narrowest field, C; and the sizes of field which may be regarded as borderline, X for myopes and presbyopes, Y for emmetropes and hyperopes.

can be given maximum serviceability in diagnosis so far as extent of field is concerned. Results are presented at this time, in part to serve as a tentative scale until a more thorough

iation of field when taken under conditions which approximate those found in the clinic, even when all external conditions known to influence the results are carefully controlled.

factors
to in-
of ad-
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In this connection, it scarcely need be pointed out that the value of a scale for diagnosis does not depend upon the normal range of variation alone, but upon this range in relation to the

Results

The fields for red and blue were taken for 126 eyes. Of these 52 were hyperopes, 19 were myopes, 21 were presbyopes, 5 had mixed astigmatism,

GREEN

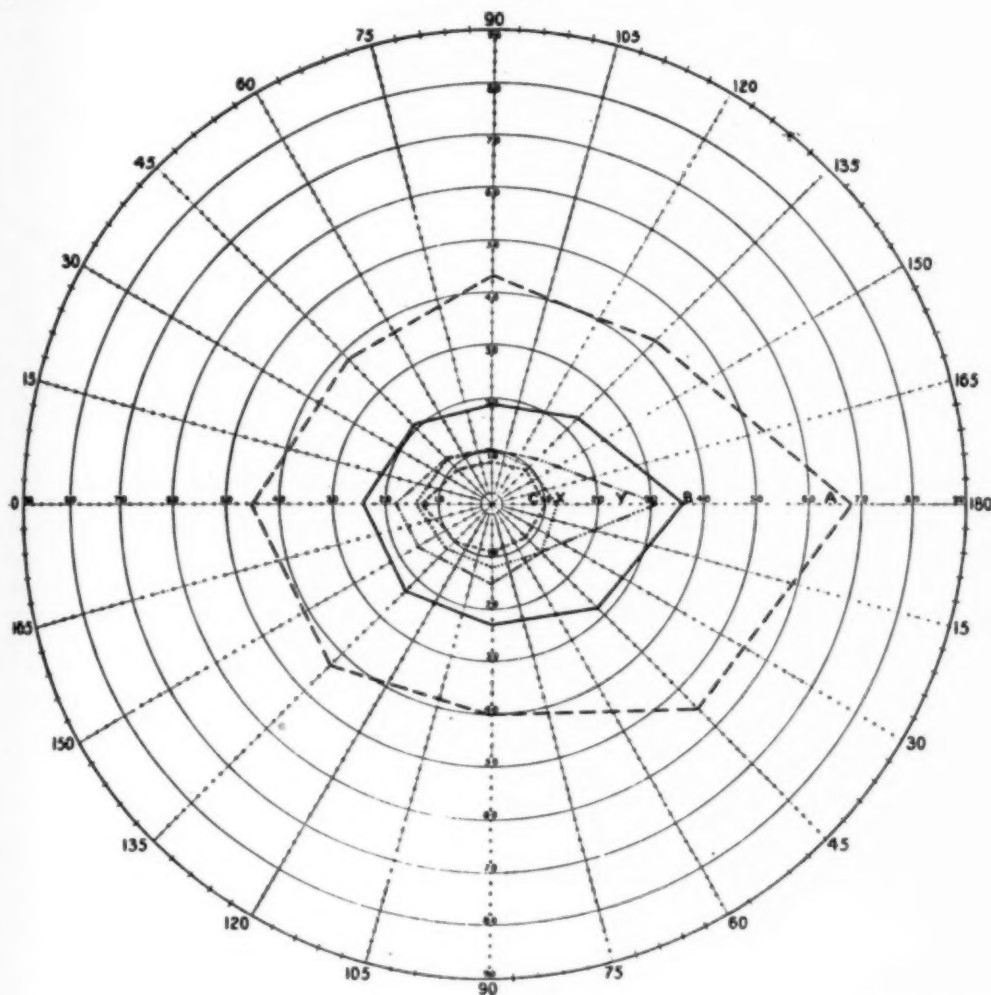


Fig. 9 (Ferree, Rand, and Monroe). Fields for green; showing the widest field, A, for 119 nonpathological cases; the average field, B; the narrowest field, C; and the sizes of field which may be regarded as borderline, X for myopes and presbyopes, Y for emmetropes and hyperopes.

pathologic range. A large normal range is of consequence only in so far as it increases the liability to overlapping with the pathologic range. Data on this point will be presented in a later paper.

and 29 showed no error of refraction or an error no greater than one diopter of hyperopia or 0.25 diopter of hyperopic astigmatism. For convenience of treatment this latter group will be referred to as emmetropic.

The field for green was determined for 119 eyes. Of these 50 were hyperopes, 18 were myopes, 17 were presbyopes, 5 had mixed astigmatism, and 29 showed not more than one diopter of hyperopia or 0.25 diopter of hyperopic astigmatism. The range of age was from eight to fifty-five years. A graphic representation of the distribution of cases is given in figures 1 to 6. The representation in figures 1 to 3 is based on the average breadth of field in the eight principal meridians; in figures 4 to 6 on the area of field mapped to scale, measured with a planimeter. In these representations the results are arranged in groups, the range of each group for the former case being two degrees and for the latter ten square centimeters. In these groups the cases are designated with regard to condition of refraction according to a key shown in the charts.

The results may be summarized as follows:

(1) In general the emmetropes and hyperopes have the wider fields, the myopes and presbyopes the narrower fields. However, the tendency for the separation into the two groups is not so clearly marked for the color fields as for the form field. Considering the refraction groups separately, we find in general the largest average breadth of field for the emmetropic group and the smallest for the presbyopic group. In order from largest to smallest the groups rank as follows: emmetropes, hyperopes, myopes, and presbyopes. The above

comparisons are shown in tabular form in table 1.

(2) The range of variation for the color fields is much larger than for the form field. A comparison of the ranges is given in table 2. In this table the range of average breadth of field in the eight principal meridians is given in degrees and per cent for the total number, the middle ninety per cent, the middle eighty per cent, and the middle fifty per cent of cases. In computing the per cent range the average value for the group in question was used as the base.

(3) In general the widest range of variation for field, estimated in terms of per cent, was found for the myopic group and the narrowest for the emmetropic group. The order from greatest to least is myopes, presbyopes, hyperopes, emmetropes. These ranges for the different colors and for the form field are given in table 3. In this table the range of variation of average breadth of field in the eight principal meridians is given in degrees and per cent for the total number, the middle eighty per cent, and the middle fifty per cent of cases for each refraction group. In computing the per cent range the average value for the group in question was used as the base.

(4) The distribution of cases is in general of the same type as was found for the form field; that is, the results when plotted approximate roughly the normal or Gaussian frequency curve. The approximation is

Table 1
SHOWING THE AVERAGE BREADTH OF FIELD FOR THE DIFFERENT REFRACTION GROUPS
FOR THE CLINIC CASES.

Stimulus	Average breadth of field					
	Myopes and presbyopes	Emmetropes and hyperopes	Emmetropes	Hyperopes	Myopes	Presbyopes
Blue	39.4	44.1	44.2	44.0	41.2	37.7
Red	34.1	38.5	38.4	38.6	36.6	31.8
Green	20.7	26.5	28.2	25.5	23.3	17.9

Table 2
SHOWING A COMPARISON OF THE RANGE OF SIZE OF FIELD FOR COLOR AND FORM FOR THE CLINIC CASES.

Stimulus	Range of size of field											
	Total number of cases			Middle 90 percent of cases			Middle 80 percent of cases			Middle 50 percent of cases		
	Limiting values	Degrees	Per cent	Limiting values	Degrees	Per cent	Limiting values	Degrees	Per cent	Limiting values	Degrees	Per cent
Blue	60.4-29.1	31.3	74	53.1-32.5	20.6	49	49.3-35.0	14.3	34	46.1-37.6	8.5	20
Red	59.9-20.1	39.8	108	49.5-28.8	20.7	57	45.9-29.3	16.6	46	40.9-32.4	8.5	24
Green	46.9-9.6	37.3	151	38.0-12.0	26.0	105	34.6-15.6	19.0	77	29.5-19.5	10.0	41
White on black	74.4-59.9	14.5	24	70.8-62.3	8.5	13	70.0-63.0	7.0	11	68.1-64.6	3.5	5

not so close, however, for the color fields as for the form field.

Because of the greater range of variation of fields and the large amount of scatter among the cases with narrow fields, the use of color fields for diagnosis presents greater difficulties than the form field. A difficulty is presented also by the greater overlapping of the scatter for the refraction groups. For all of these reasons a borderline or suspicious group can not be delimited as satisfactorily for color as for form. However, it can probably be safely concluded that the field of an emmetrope or hyperope that has an average breadth of less than 34 to 35 degrees for blue, 30 for red, or 16 for green in eight principal meridians must be classed as suspicious. For a myope or presbyope the borderline probably falls near 32 to 34 degrees for blue, 28 degrees for red and 12 to 14 degrees for green. In case area of field is taken as the index, the borderline for emmetropes and hyperopes may be taken as approximately 50 sq. cm. for blue, 40 sq. cm. for red, and 10 to 12 sq. cm. for green; for myopes and presbyopes 40 sq. cm. for blue, 30 sq. cm. for red, and 5 to 7 sq. cm. for green.

In figures 7 to 9 maps are given showing for each of the colors the largest, average, and smallest fields, and the outer boundaries of the two groups that have been called borderline or suspicious. Of these latter two sets of fields, X represents the widest of the fields whose average breadth in the eight meridians falls below 34 degrees for blue, 28 for red, and 12 for green. Any field smaller than this we have called suspicious for myopes or presbyopes. Y represents the widest of the fields whose average breadth in the eight meridians falls below 36 degrees for blue, 30 for red, and 16 for green. Fields smaller than these for emmetropes or hyperopes may be regarded as suspicious. An exaggerated impression of the variation of size of field is given by the maps because of the

Table 3
SHOWING A COMPARISON OF THE RANGE OF SIZE OF COLOR AND FORM FIELDS FOR THE DIFFERENT REFRACTION GROUPS FOR THE CLINIC CASES

Stimulus	Total number of cases				Range of size of field							
	Limiting values		Degrees		Middle 80 per cent of cases				Middle 50 per cent of cases			
	Limiting values	Degrees	Per cent		Limiting values	Degrees	Per cent		Limiting values	Degrees	Per cent	
A: Emmetropes												
Blue	56.0-34.6	21.4	48		50.5-38.8	11.7	27		47.9-40.8	7.1	16	
Red	50.1-29.4	20.7	51		47.4-32.4	15.0	39		40.9-34.3	6.6	18	
Green	46.9-16.5	30.4	108		40.4-19.6	20.8	75		32.4-22.4	10.0	37	
White on black	73.0-62.9	10.1	15		70.4-64.3	6.1	9		69.8-65.3	4.5	7	
B: Hyperopes												
Blue	57.0-35.3	21.7	49		49.5-38.3	11.2	26		46.5-40.8	5.7	13	
Red	58.6-30.6	28.0	73		45.9-31.5	14.4	38		41.4-33.6	7.8	21	
Green	40.1-14.1	26.0	102		34.3-17.6	16.7	67		29.8-20.6	9.2	37	
White on black	74.4-60.6	13.8	20		70.6-64.5	6.1	9		68.3-65.6	2.7	4	
C: Myopes												
Blue	60.4-31.0	29.4	71		46.8-32.8	14.0	34		45.5-35.8	9.7	24	
Red	59.9-25.8	34.1	96		43.3-29.1	14.2	40		39.4-30.4	9.0	25	
Green	36.9-11.8	25.1	108		35.6-15.1	20.5	88		28.1-16.8	11.3	50	
White on black	72.0-59.9	12.1	19		69.5-61.5	8.0	12		67.0-62.9	4.1	6	
D: Presbyopes												
Blue	48.5-29.1	19.4	51		45.1-31.9	13.2	36		39.9-33.0	6.9	19	
Red	46.9-20.1	26.8	84		40.3-26.9	13.4	43		33.3-28.8	4.5	15	
Green	33.4-9.6	23.8	133		31.6-9.6	18.5	106		22.4-11.9	10.5	64	
White on black	69.1-61.0	8.1	13		67.3-62.8	4.5	6		66.1-63.3	2.8	4	

exceptionally wide fields of two observers in the group—one for blue and red, the other for green.

As in the former paper on the form field, data will be added for fields taken under laboratory conditions (figures 10 to 12)². For these de-

had an acuity of six-sixths or better under five foot-candles of illumination. Of the cases classed as emmetropic in the clinic group, seven showed no error of refraction without a cycloplegic: these all had an acuity of six-sixths or better and ranged in

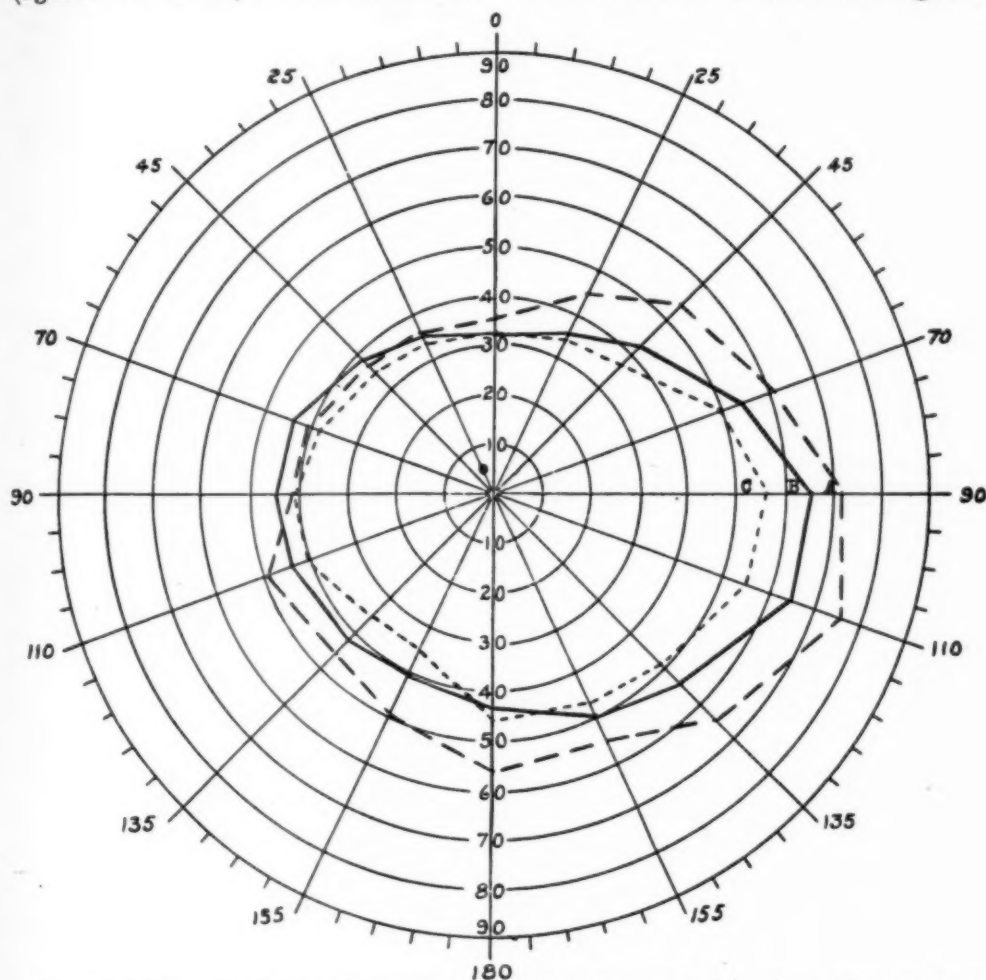


Fig. 10 (Ferree, Rand, and Monroe). Fields for blue; showing the widest field, A, for fifteen nonpathological cases; the average field, B; and the narrowest field, C. The observers used in this and the two following charts showed no errors of refraction when examined without a cycloplegic: they were under twenty-six years of age and were of 6/6 acuity or better. The fields were taken in sixteen meridians and under laboratory conditions.

terminations the same observers were used as in the former work. They were all under twenty-six years of age (range twenty to twenty-six), showed no errors of refraction when examined without a cycloplegic, and

² These fields were taken by F. Selligman and R. Beardsley.

age from thirteen to thirty-five years. In the laboratory study the fields were determined in sixteen meridians instead of eight, and the observers were given enough practice to secure in each case a close reproducibility of result. The same instrument, stimuli and external controls were used as in

the clinic work. The method was in general the same, with the exception that the greater care and precautions possible in laboratory work were used. In general larger fields were obtained than in the clinic studies and a much narrower range of variation. The difference between the laboratory and clinic results in these respects

average breadth of field for blue was 46.1 degrees, for red 45.9 degrees, and for green 38.4 degrees. In the clinic study, 126 observers, the average breadth of field for blue was 42.3 degrees, for red 36.8 degrees, and for green 24.7 degrees. In the laboratory study the form fields varied from 62.3 to 72.6 degrees, a range of fi-

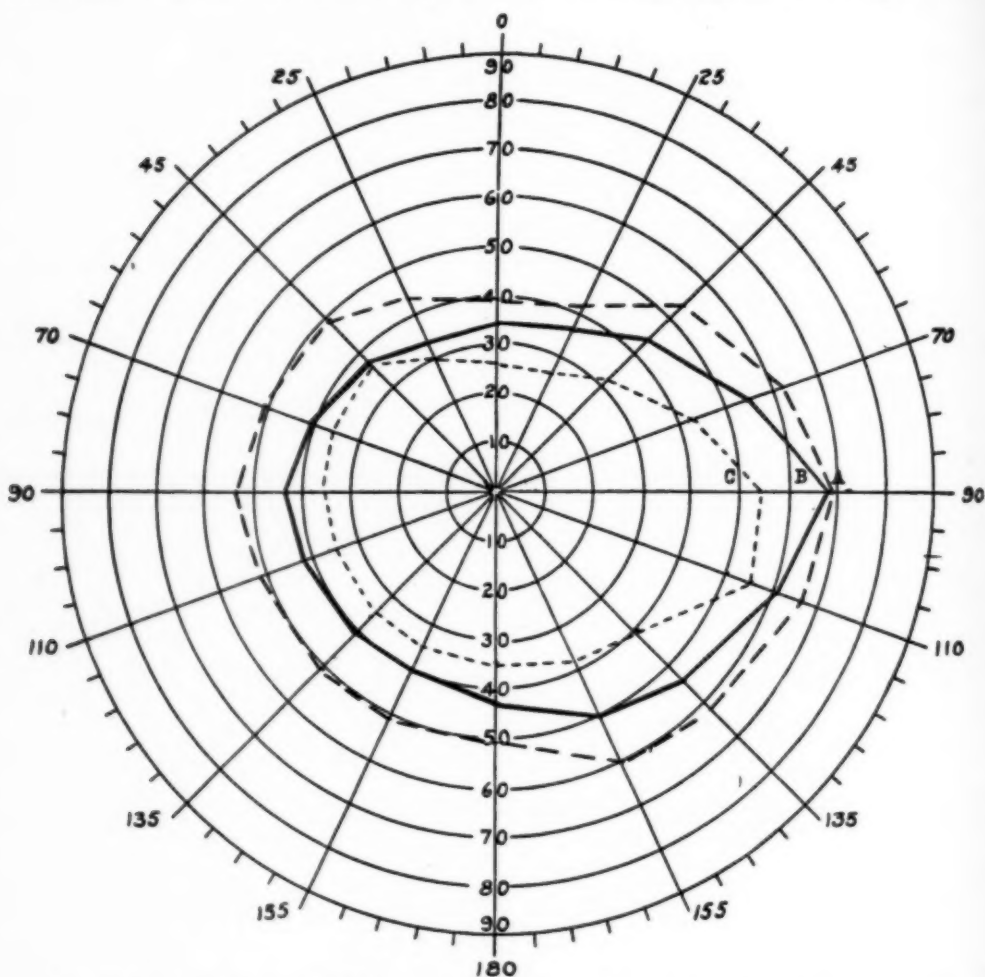


Fig. 11 (Ferree, Rand, and Monroe). Fields for red; showing the widest, average, and narrowest fields for fifteen nonpathological cases.

was much greater for the color fields than for the form field.

In the laboratory study the average breadth of form field in the sixteen meridians for the fifteen observers used was 67.5 degrees; the average in the clinic determinations, two hundred observers, was 66.4 degrees. In the laboratory study of the color fields, fifteen observers, the

average breadth of field for blue was 46.1 degrees, for red 45.9 degrees, and for green 38.4 degrees. In the clinic study, 126 observers, the average breadth of field for blue was 42.3 degrees, for red 36.8 degrees, and for green 24.7 degrees. In the laboratory study the form fields varied from 62.3 to 72.6 degrees, a range of fifteen per cent; in the clinic study from 59.9 to 74.4 degrees, a range of 24 per cent. In the laboratory study the fields for blue varied from 41.7 to 51.2 degrees, a range of 21 per cent; in the clinic study from 29.1 to 60.4, a range of 74 per cent. In the laboratory study, the fields for red varied from 37.4 to 55 degrees, a range of 38 per cent; in the clinic study from 20.1 to 59.9

degrees, a range of 108 per cent. In the laboratory study the fields for green varied from 24.9 to 50.6 degrees, a range of 67 per cent; in the clinic study from 9.6 to 46.9 degrees, a range of 151 per cent. In computing these percentages the average value for the group of results in question was taken as the base.

laboratory study as were used for the form field, and a smaller number of the same observers in the clinic study. (b) The average breadth of field for the emmetropic group for the clinic and laboratory studies was about the same for the form field, and the range was even a trifle less for the clinic than for the laboratory

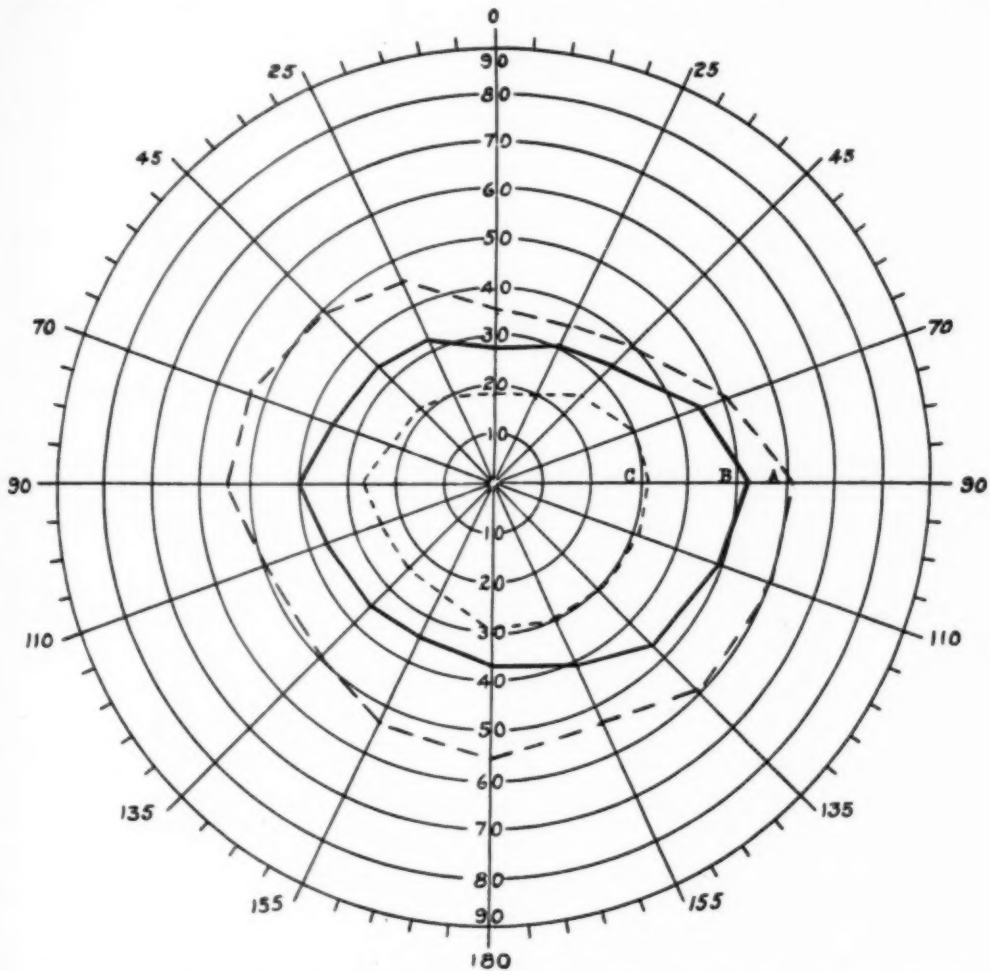


Fig. 12 (Ferree, Rand, and Monroe). Fields for green; showing the widest, average, and narrowest fields for fifteen nonpathological cases.

That the differences recorded above between the laboratory and clinic results for the color fields are not due entirely to the difference in the number of cases examined is rendered probable by the following facts: (a) The differences are much greater than they were for the form field although the same observers were used in the

study. For the color fields, however, the average breadth of field was considerably less for the clinic than for the laboratory study, and the range was considerably greater, even though a smaller number of cases was used for the color fields in the clinic study than was used for the form field.

Wilmer Ophthalmological Institute.

PHOTOMICROGRAPHY OF THE LIVING EYE. 5, THE PHYSICS OF CERTAIN TYPES OF CORNEAL OPACITY

Preliminary report of experimental work.

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Photomicrography of corneal opacities seemed to indicate that the visual acuity of eyes having such opacities of a diffuse type could be given better visual acuity by excluding light of wave lengths of less than 5100 millimicra as compared with the best acuity obtainable with white light. The resolving power was not further increased by utilization of frequencies beyond 5800 millimicra.

A method having been developed which permits the taking of large-scale photographs of the anterior segment of the human eye with great

relationship to visual acuity, and in general to study their distribution and topography.

This report is concerned with the



Fig. 1 (Redway). Photomicrograph of right eye of a woman with glaucoma and iritis. This was taken by white light (arc), unfiltered.

accuracy¹, it has become possible to study opacities of the cornea in the living eye in an attempt to define their behavior to light and their rela-

behavior of diffuse, generalized corneal opacities under light of different wave-length, and with the variations of visual acuity in the presence of

such opacities under light of known wave-length. In simpler terms, does an individual having a diffuse corneal opacity see with greater distinctness under ordinary circumstances by means of light of a given order than by means of light of another order? Ordinary circumstances are here specified because it is conceded that this

usual glaucomatous type (tension 48 mm. Hg). Through this haze the details of the iris, where these could be seen at all, appeared as though viewed through ground glass. As may be seen, the corneal light reflex is distorted at its margins by the uneven character of the epithelium, which is pitted. The congested blood vessels

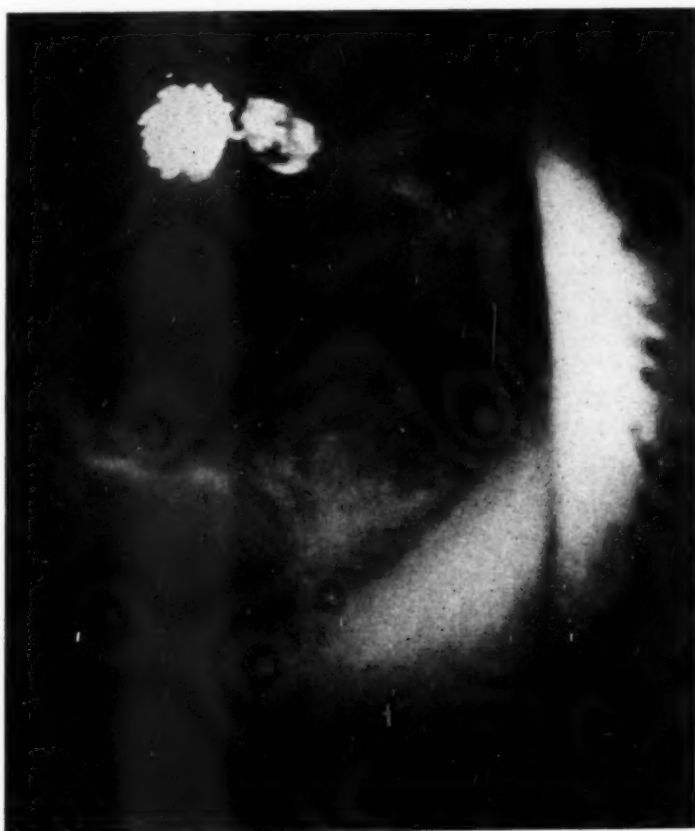


Fig. 2 (Redway). Same as figure 1 but photographed by red light. Note disappearance of corneal turbidity and reappearance of iris detail.

can be accomplished by laboratory methods and under experimental conditions not met with in daily life.

These experiments are based upon photomicrographs shown herewith, of eyes the corneas of which were diffusely clouded by opacities. The first of these photomicrographs was taken by white light (arc) of the right eye of a woman who had had both iritis and glaucoma. The cornea exhibited to inspection the diffuse haze of the

of the conjunctiva appear at the corneal margin to the left.

The second photomicrograph is of the same eye under exactly similar circumstances, except that it was photographed three minutes later through a Wratten F-filter cutting at $6100 \mu\mu$. (Fig. 2.) The corneal light reflex is similarly distorted by the surface epithelium, but a glance at the cornea will show that the haze has now disappeared, revealing the iris and show-

ing clearly the adhesions of its borders to the lens. The vessels at the corneal margin have likewise disappeared, their contrast having been destroyed by the red filter.

Since conditions of developing and printing for each of these photomicro-

white light than by red light. It follows further that the optical system of the eye should under these conditions exhibit a greater resolving power by red than by white light.

In order to test the validity of these observations and of the conclu-

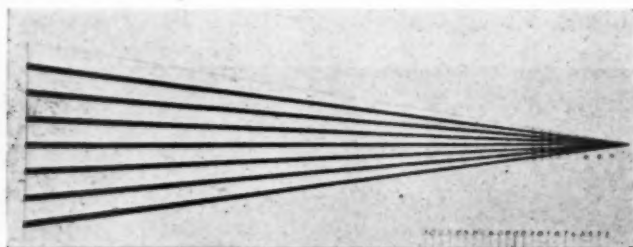


Fig. 3 (Redway). Fan test object for testing resolving power. This is so constructed that from apex to base it measures just 717 millimeters. Being in black and white, it affords the maximum possible contrast values, which is perhaps a little unfortunate in that these maxima are not found in ordinary circumstances.

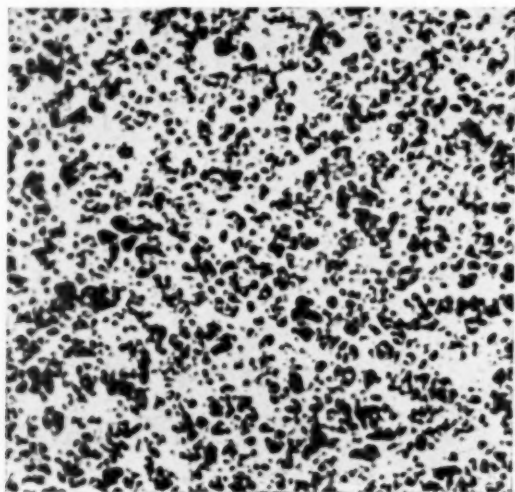


Fig. 4 (Redway). Photomicrograph ($\times 250$) of the surface of ground glass no. 2, showing rather even size and distribution of the elements of the opacity.

graphs were identical, and since the emulsion used was the same, it is permissible to surmise that the disappearance of corneal haze and the greater clarity of detail in the iris may be due to the employment of the red filter. If this is so, it follows that for opacities of this order at least a greater turbidity is observed by

sions drawn from them, the following experimental work was done:

A test object was constructed following the original plan of Mees as used by K. Huse². (Fig. 3.)

Two samples of ground glass were next made by grinding pieces of optically plane glass two mm. thick, on one side only and with different

grades of emery. The ground side was subsequently given a slight polish. The types of opacity produced in the respective cases are shown in

Fig. 5 (Redway). Photomicrograph ($\times 250$) of the surface of ground glass no. 3, showing larger size, greater variation in size, and unequal distribution of the elements of the opacity.

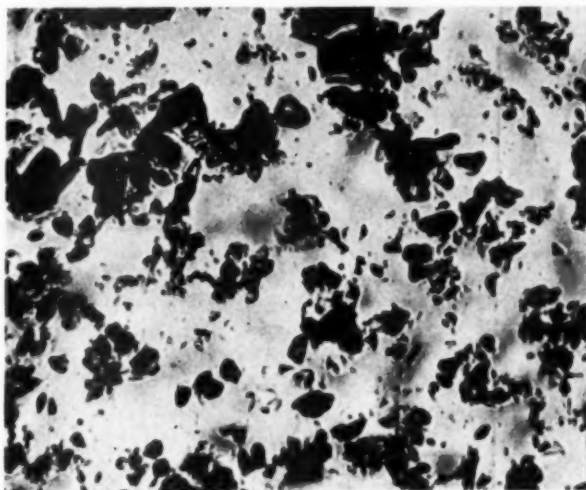


Fig. 5 (Redway). Photomicrograph ($\times 250$) of the surface of ground glass no. 3, showing larger size, greater variation in size, and unequal distribution of the elements of the opacity.

figures 4 and 5, which are photomicrographs of the ground surfaces under an approximate magnification of 250 diameters.

The apparatus was then set up in the laboratory as indicated in the diagram, the test object being placed at thirty-two feet from the camera lens. (Fig. 6.) This yielded an image of the test object on the plate seven mm. in length and gave a separation of the lines on the plate such that it could be easily read with a standard magnifier. The illumination of the test ob-

ject was by two 500-watt mazda lamps and was maintained constant throughout the tests. The filters were the ordinary Wratten spectroscopic gelatine flats cutting sharply at 4600, 5100, 5800, 6100, 6450, and 6800 μ respectively. The emulsion used was Ilford "special rapid panchromatic 6,095-D" and the developer a standard metol hydrochinon formula. Full exposure of the plate and minimum development time were sought in order to make fully available the resolving power of the photographic emulsion³.

Three plates were made each time:

- (1) with the camera lens and filter;
- (2) with the lens, the filter and the

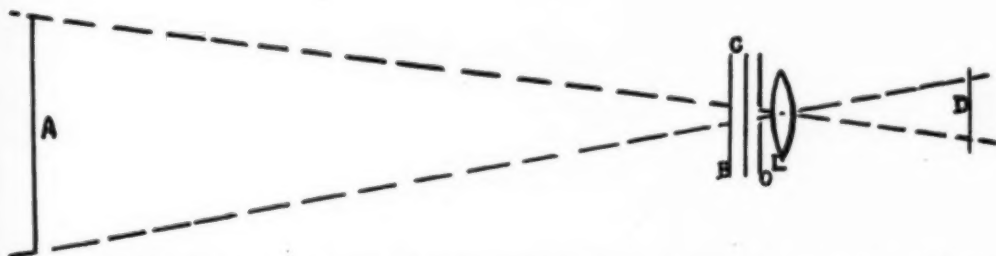


Fig. 6 (Redway). Drawing of laboratory arrangement of apparatus. A, test object; B, filter; C, ground glass; O, iris diaphragm; L, camera lens; D, plate. The distance AL = 32 feet.

no. 2 ground glass; (3) with the lens the filter and the no. 3 ground glass. This procedure checked the resolution of the lens and filter at each spectral level without the ground glass and with it. The plates were read when dry and the distance from the point of the test object noted at which the separation of adjacent lines was just definable. Since the separation of the lines on the test object at a corresponding point is known by actual measurement, the separation of the lines on the plate may be calculated by the simple proportion:

$$O : I :: L : x$$

where O = length of test object; I = length of image; and L = separation of lines on the test object in millimeters; thus

$$\frac{7\text{mm.} \times L}{717 \times x}$$

or

$$x = \frac{7 \times L}{717}$$

A number of determinations were also made at thirty-two feet with the naked eye and the same filters as were used in the photographic tests. The subjects of this test were carefully refracted and tested for possible deficient color vision. The object of this procedure was to define if possible a normal acuity value for comparison at each of the bands utilized, thus affording a basis for comparing the photographic values found.

Fig. 7 shows graphically the results of these determinations. Here the resolving powers in fractions of a millimeter are plotted horizontally against wave-lengths vertically. The graph marked "normal visual acuity" is that derived as above described and is the mean of a large number of determinations with normal eyes. As a check on the accuracy of these findings, there is shown herewith a photostatic copy, graphically illustrating the curve of visibility of 125 normal persons, from figure 13 of the bulletin of the United States Bureau of Standards. (Fig. 8.) This merely relates to the

color sensitivity of normal eyes at various frequencies, but is of interest when correlated with the acuity values for the same spectral bands.

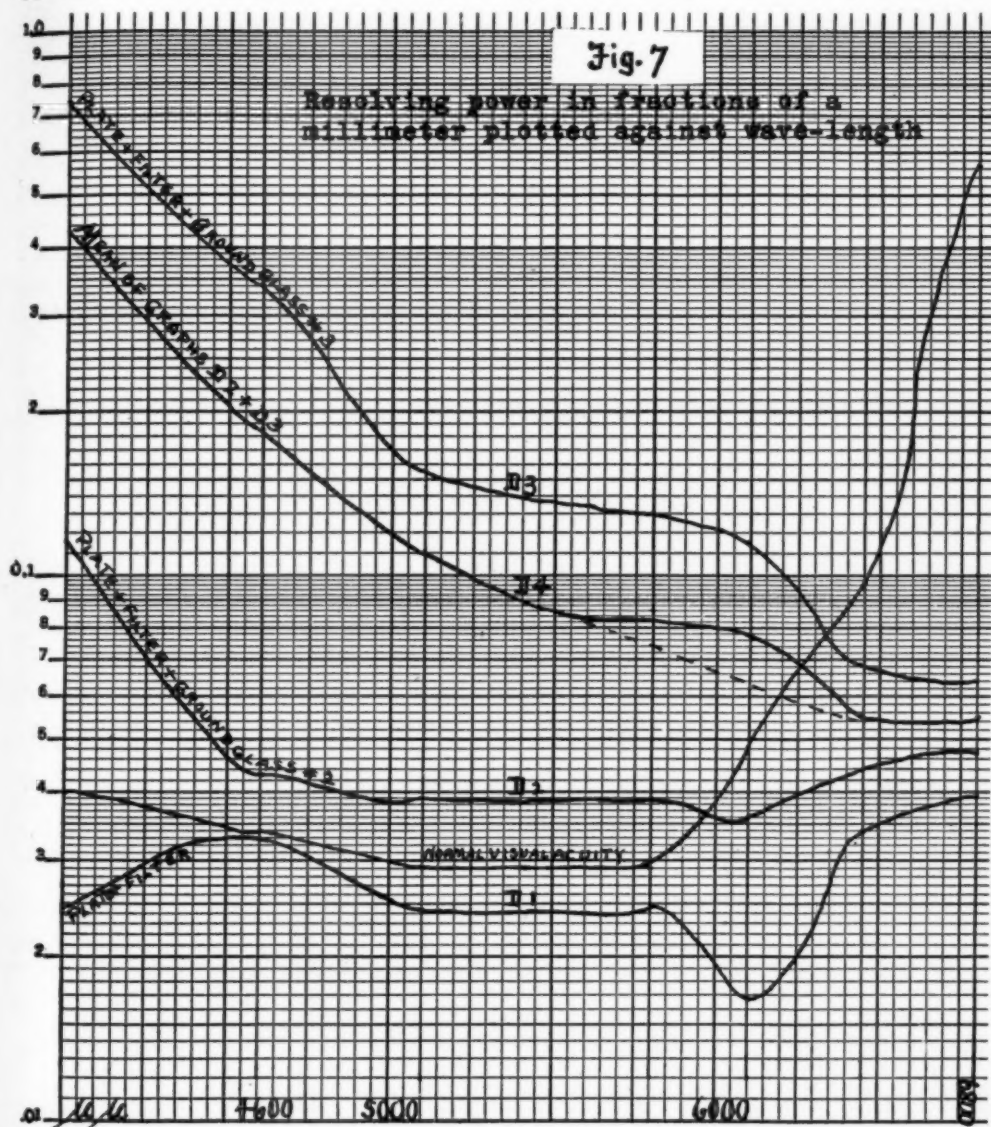
Graph D 1 is that obtained with the plate and filter only, and is a measure of the greatest resolving power obtainable with the optical system employed, and a measure of the sensitivity of the plate itself. The exposure time yielding this curve was the basis for calculating the times of exposure for graphs D 2 and D 3. D 2 and D 3 are the graphs respectively of the exposures made through the ground glass discs no. 2 and no. 3, while D 4 is the mean of these two. It was thought that the graph of the mean would serve the purpose of eliminating some of the possible individual errors present in either graph 2 or 3. It is indeed seen that the probable correct solution lies in D 4, with the elimination of the hump as indicated by the dotted line.

From the results of these determinations, it would be proper to state that, by the utilization of certain selected bands of the spectrum in the presence of opacities of the cornea of the order of those under consideration, a gain in visual acuity is possible over that afforded by ordinary white light of average intensity. It seems also that the gain in resolving power up to 5800 $\mu\mu$ is greater for opacities composed of larger elements than for those composed of smaller ones. Additionally, since there is relatively little gain in acuity for normal eyes up to 5800 $\mu\mu$, and practically none by reason of increased resolving power of the plate itself (D 1), it seems safe to assume that the gain indicated in graphs 2 and 3 is a function of the light frequency in the presence of such opacities as are here considered, and is not dependent upon physiologic characteristics of the eye itself as might reasonably be assumed by reference to figure 13. For the gain as recorded by the photographic plates is independent of any physiologic considerations affecting the eye.

In order to eliminate as far as pos-

sible error arising from the influence of the state of the pupil on the resolving power under the conditions of these experiments, a study was made of eyes presenting opacities of the type under consideration. A surpris-

very closely corresponds to an aperture of f. 16 in the camera lens. The exposures were therefore made at this aperture with no attempt to compensate for filter density. This is admittedly a source of error, but seems



ingly large number of these presented fixed or partially fixed pupils, and the pupillary reactions of a great many more were extremely sluggish. Actual measurement of the apertures yielded an average of four mm. diameter, the equivalent of 12.564 sq. mm.; and this

to fulfil the conditions of "ordinary circumstances". It will tend to place the resolving powers a little higher than they should be, but the error will at the same time be relative.

What practical conclusions may be drawn?

1. The visual acuity of eyes presenting opacities of a general diffuse order may be improved over the best that can be obtained with correction

greater resolving power by utilization of frequencies beyond $5800\ \mu\mu$, no matter what the order of opacity may be, since not only does retinal sensitivity

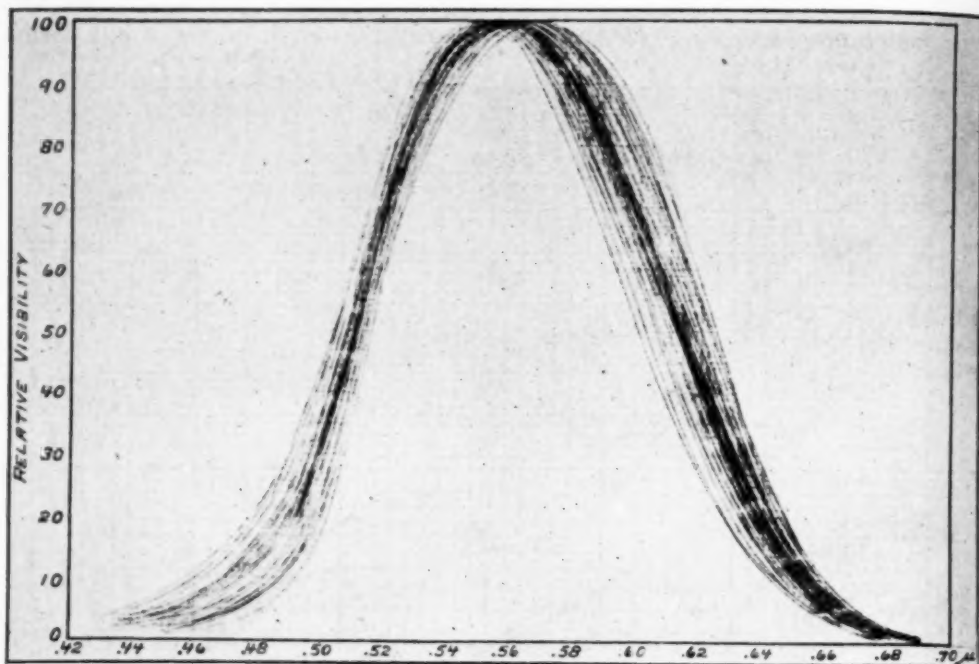


Fig. 8 (Redway). Composite visibility curve of 125 persons. (From Bulletin of U. S. Bureau of Standards, vol. 14, fig. 13.)

of refractive errors and by white light, by excluding light of wave-length less than $5100\ \mu\mu$, and under conditions of ordinary illumination.

decreases rapidly beyond this point, but contrast is so exaggerated as to be practically intolerable.

2. It is useless to attempt to gain

The Andrew Todd McClintock Memorial Foundation, 285 Madison avenue.

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RHABDOMYOMA OF THE EYELID*

LEO L. MAYER, M.D.

SAINT LOUIS

In a man of sixty-six years, a swelling of the lower lid had been treated with some kind of caustic by the family physician. The growth was lumpy, firm but not hard, and the lower lid was drawn down, exposing the conjunctiva. Microscopically the excised tumor consisted of a subepithelial thick layer of dense connective tissue, with deeper layers of striated muscle fibers separated by dense masses of connective tissue. In the fibrous tissue there were many groups of lymphocytes and plasma cells, mostly around capillaries. From the eye clinic of Washington University dispensary.

The rarity of any conditions is relative. In both private practice and clinic experience there are many cases seen by the ophthalmologist which are unusual to an individual and often even to a group of men, and yet such cases may not be reported in the literature. Often the clinician is lazy, sometimes modest, and frequently because of failure to investigate previous case reports the unique condition is lost forever to medicine.

It is interesting to note that of the five cases of ocular rhabdomyoma which I was able to discover in the literature two had been reported by Saint Louis ophthalmologists. However, I do not feel that the locality has any influence on the incidence of such growths.

In 1895 Dr. J. Ellis Jennings¹ reported a rhabdomyoma of the orbit, and in 1896 Dr. Adolph Alt² had the following to say concerning a rhabdomyoma of the eyelid: "Our knowledge of the different forms of new growths occurring in the eyelids has been considerably enlarged within the last decade. The following is, as far as I know and can find out, a totally new observation."

The American Encyclopedia of Ophthalmology quotes only the case cited above as reported by Jennings, while Parsons' "Pathology" and the volume by Collins and Mayou make no mention of such a tumor.

In 1910 Schnaudigel³, in reporting a case, attempted to review the literature. He quotes Benenati⁴, who in summarizing the cases of rhabdomyoma of all organs of the body reported up to the year 1900 could only

find sixty-four cases. Zenker⁵ reported a case in 1890, and S. Bayer⁶ is said to have first seen a rhabdomyoma in 1882, although I have been unable to acquire the literature for confirmation.

Three years after Schnaudigel's review he⁷ saw the patient on whom he had operated, and discovered a recurrence of the tumor.

Alt's² description of the tumor as an elastic painless growth resembling a chalazion, and consisting of striated muscular tissue in all stages of development, is characteristic of the rhabdomyoma.

In the Graefe-Saemisch Handbuch der Augenheilkunde, L. Schreiber says that rhabdomyoma or myoblastoma striocellulare of the lid is extraordinarily rare.

Case: B. W., aged sixty-six years, entered the eye clinic of the Washington University dispensary on September 17, 1928. He gave a history of having an injury of the cornea of the left eye following smallpox when a child. Six years ago last July (1922) patient's cheeks and nose were severely blistered and sunburned. Scabs from these burns did not disappear for more than two years. Later there were sores on the nose and right cheek extending up to the right eye. He compared them with boils and said they were similar to what he then had on his cheek. The hospital record is essentially negative, including Wassermann, urine, blood examination, and general physical.

In August, 1928, he had itching and burning of the right lower lid, with epiphora. The lid started to swell

and became larger. On consulting his family physician in a small Illinois town he was treated with a caustic, the exact nature of which I was unable to determine. Frequent applications of this caustic over a six months period failed to remove the growth.

When I first saw him there was a small lumpy growth about 0.75 mm.

The constant irritation and epiphora of the exposed good eye was particularly annoying to the patient. He was referred to the skin clinic, where a diagnosis of epithelioma basocellulare of the right lower lid was made. The characteristic pearly border around a small ulcerated area which had developed at this time was stressed by the dermatologic consul-



Fig. 1 (Mayer). Section through rhabdomyoma of lower eyelid, showing E, epidermis; M, voluntary muscle fibers; and C, connective tissue between muscle bundles. (Magnification 53 times.)

in thickness, slightly beefy in appearance, firm but not hard near the inner canthus. The lower lid was drawn down, exposing the conjunctiva, especially near the tumor at the inner canthus. There was a marked dermatitis of the skin over the zygoma, and constant epiphora. The visual acuity of the right eye was 6/15 or 20/50, but with +1.25 sph. — 0.75 cyl. ax. 180° was 6/5 or 20/15. Visual acuity in the left eye was hand motion at one-half meter or about eighteen inches.

tant, but this I am sure was due to the caustic used previously. The patient was also referred to the radiological department, and advice was given against the use of radium.

On September 20, 1928, the patient entered the Barnes Hospital, where the tumor mass was excised, and a pedicle flap brought down from the right side of the nose was used in reestablishing the lower lid.

Uneventful recovery and good plastic as well as functional results followed, and there has been no sign

of a return of the tumor up to the time of writing, three months after operation.

For the excellent pathological report I am indebted to Dr. Harvey Lamb, associate professor of pathology in the Department of Ophthalmology.

The accompanying photomicro-

accumulations of cells vary greatly in size and shape, and in many cases they are grouped around the capillaries. Many young fibroblasts appear among the connective tissue fibers. Beneath this layer of fibrous tissue there occur many striated muscle fibers coursing generally parallel to the surface, in groups separated

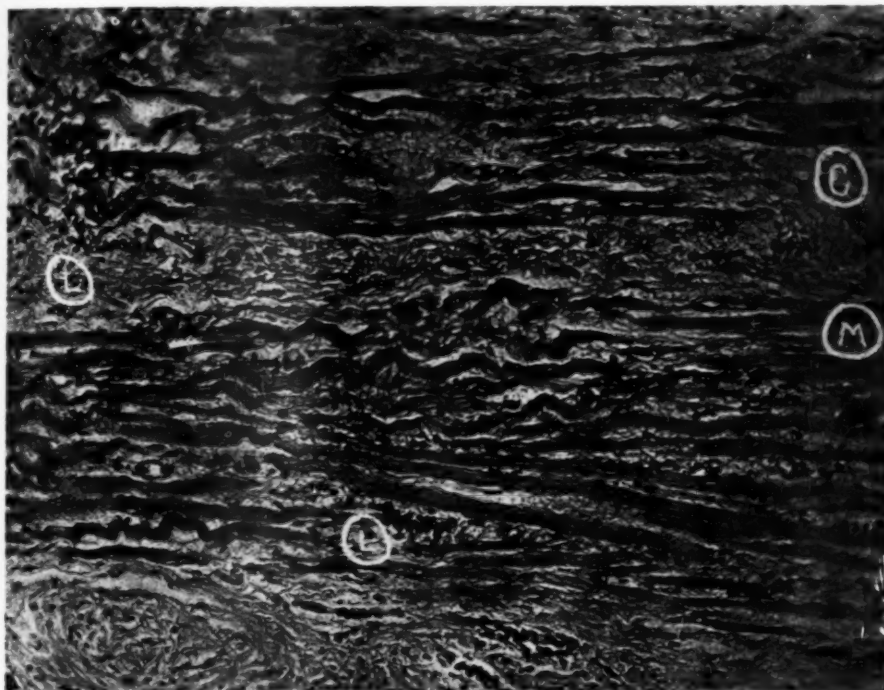


Fig. 2 (Mayer). Typical section through rhabdomyoma of lower eyelid, showing M, striated muscle fibers; C, intermuscular fibrous tissue; and L, infiltration with plasma cells and small lymphocytes. (Magnification 171 times.)

graphs show clearly the nature of the rhabdomyoma.

Pathological report: A mass 5 by 5 mm. was removed from the lid September 26, 1928. The color of the tissue on section was whitish and the consistency dense and firm. Striations parallel to the surface could be made out on the cut surface.

Microscopic findings: Just beneath the epidermis there is a thick layer of dense connective tissue containing many dense accumulations of small lymphocytes and plasma cells. These

by dense masses of connective tissue. In the fibrous tissue there are many small groups of small lymphocytes and plasma cells; most of these accumulations occur about capillaries. Several cystic spaces lined with one to several layers of cells are seen among the superficial muscle fibers; these spaces have evidently occurred in formed downgrowths of the epidermis.

Diagnosis, rhabdomyoma of the lower eyelid.

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RETINAL HEMORRHAGE AS AN EXPRESSION OF VICARIOUS MENSTRUATION

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and

S. J. MEYER, M.D., Chicago

The literature is reviewed. In the case reported the evidence of a causal relationship between abnormal menses, the presence of blood in the retinal tissue, and traces of previous retinal hemorrhages seemed sufficient to indicate that the hemorrhage was an example of vicarious menstruation. Read before the American Academy of Ophthalmology and Otolaryngology, Saint Louis, October 15 to 19, 1928.

By vicarious menstruation is meant an extragenital hemorrhage at or near the time of normal menstruation, either substitutional for it or complementary to it. This phenomenon occurs very rarely, Roth¹⁸ having been able to collect only 225 cases from the literature since 1870. The organs and tissues affected, in order of frequency, are: the nose (Walker²¹, Coughlin⁴, Macht¹⁶), stomach (Kuttner¹⁴, Darnall⁵), intestinal canal (Holmes¹²), lungs (Ford⁸), mammary gland (Novak¹⁸, Thornton²⁰, Hirschberg¹¹, Ziegenspeck¹⁸, Lambinon¹⁸, Condit³), skin (Parrot¹⁸, Mueller¹⁸, Chambers¹⁸, Anderson¹⁸, Opel¹⁸), lips (Hauptmann¹⁰, Coughlin⁴), eye (Huizinga¹⁸, Powell¹⁸, Claiborne¹⁸, Meanor¹⁸, Espino⁷, de Schweinitz⁶, Terrien and Cousin¹⁹), nevi (Bloom², Condit³), kidneys (Ford⁸, Cuturi¹⁸, Dschigit¹⁸), old cicatrices (Kerley²³), abdominal fistulae (Bircher¹), umbilicus (Gardner⁹, Cullen¹⁸), gums (Beers¹⁸), and stumps of amputated extremities (Puesch¹⁸).

There are several explanations of vicarious menstruation, the most logical of which is based upon a theory which tries to explain normal menstruation. This theory states that there is in vicarious menstruation, in

the tissues of the affected area, an abnormal sensitiveness to the ovarian hormones, analogous to the normal sensitiveness of the endometrium in normal menstruation.

Disorders of menstruation are frequently associated with ocular lesions. De Schweinitz⁶ assigns such an etiology to vitreous opacities, hemorrhagic retinitis, optic neuritis, and primary optic atrophy. Terrien and Cousin¹⁹ mention the following conditions as being dependent on menstrual disturbances: conjunctival hyperemia, hemorrhages into the retina and vitreous, diminution of visual acuity, accommodative asthenopia, contracted visual fields, crises affecting the tri-facial which lead to increased intra-ocular tension and even glaucoma, photopsia, hyperemia of the disc, amaurosis, and edema of the lids. Espino⁷ reported the case of a woman who always had a hyperemia of the conjunctiva at the time of menstruation, while Meanor¹⁶ described the case of a woman who at each menstrual period had a hemorrhage into the vitreous, the opacities lasting nearly to the next period. She had had blurred vision during menstruation ever since its inception. He also spoke of a case

of sarcoma of the iris in which the patient had a hemorrhage into the anterior chamber at each menstrual period. In the discussion Van Kirk¹⁶ spoke of a woman who had an edema of the eyelids and cheeks for three or four days at each period, and reported also the case of a woman who developed two or three blebs on the eyelid when she began to menstruate. Huizinga¹⁸ reported the case of a girl of seventeen years who had an attack of dizziness and faintness, followed by a rapidly developing dimness and distortion of vision, first in the left eye, and in a few minutes in the right. The fundi showed the picture of hemorrhagic retinitis. The spots cleared up after the menstruation, only to recur at two subsequent periods, while she was under observation.

The patient whose ocular condition was the incentive to the preparation of this paper is Miss M. S., white, aged twenty-six years, a social worker by occupation. She was first seen at the Michael Reese Dispensary on September 24, 1927. Her complaint was of headaches, recurring about once a month for the past year, which seemed to be worse following the use of the eyes, but which were unaffected by the state of the weather. Between these attacks, she felt well. The periodicity of the attacks led to an inquiry about their relation to the time of her menses. The patient was at first uncertain about this, but on subsequent visits was rather inclined to the belief that the time relation was intimate.

Externally, her eyes were normal. Manifest refraction showed an emmetropia in each eye. With both eyes open, she could read the 6/6 line with difficulty when plus 0.5 sphere was placed in front of each eye. The fundus of the right eye was normal. In the left eye, just where the upper horizontal temporal branch of the arteria centralis retinae leaves the disc, there was a flame-shaped hemorrhage, about one d.d. in length, and one-third d.d. in height at its broadest part. In the temporal periphery were

a couple of isolated small black spots, each surrounded by a light reddish area, giving the impression of their being remnants of previous hemorrhages. The remainder of the fundus showed nothing abnormal.

The family history of the patient revealed that an uncle and a cousin had died of tuberculosis. The personal history contained nothing significant except the statement that her menses were always delayed and painful. The physical examination revealed nothing abnormal except a small cyst of the right ovary. All laboratory tests were normal. No treatment was instituted.

October 1, one week later; hemorrhage almost absorbed.

October 15, the fundus shows no sign of the hemorrhage formerly present.

October 19, states that her menses were on October 17, at which time she had occipital headache, but no subjective ocular symptoms. Both fundi were normal ophthalmoscopically; V. = 6/6.

The patient was seen at irregular intervals up to December, at which time the illness of one of us (Loeb), who had been following the case, was followed by disappearance of the case from observation. Although the headaches recurred, no other hemorrhage was ever observed.

The authors recognize the fact that the diagnosis of retinal hemorrhage due to vicarious menstruation is open to objection, but when we take into consideration the history of the periodic monthly headaches, of short duration, occurring about the time of menstruation, which itself was always delayed and painful, coupled with normal refraction, normal physical findings and normal personal history, we feel that there is evidence of a causal relationship between the abnormal menses, the presence of blood in the retinal tissue, and the traces of previous retinal hemorrhages, sufficient to justify the diagnosis of retinal hemorrhage due to vicarious menstruation.

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THE VALUE OF THE POSTCYCLOPLEGIC TEST

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Often a postcycloplegic test is a poor substitute for careful preliminary examination of the patient's refraction. At the postcycloplegic examination, ciliary cramp may greatly mislead and may cause us to lose any real benefit from the cycloplegic; for the patient's only ultimate hope of breaking up ciliary spasm may lie in faithfully wearing the correction found under cycloplegia. Many patients finally wear with great advantage corrections which at first caused very annoying distant blur. There is danger that undue respect for the postcycloplegic test may reduce us to the level of the "optometrist." Read before the Colorado Congress of Ophthalmology and Otolaryngology, July 20 and 21, 1928.

It is possible either to underestimate or to overestimate the value of the postcycloplegic test. There are cases in which a postcycloplegic test is entirely unnecessary, cases in which it is of decided value, and cases in which, as ordinarily employed, its effect is to mislead the physician and to prevent a satisfactory result to the patient.

So far as the distant correction is concerned, the ideal which I hold constantly before me in doing my refraction work is to render the patient emmetropic. What is an emmetropic eye? It is one which brings parallel rays of light to a focus upon the retina, or which in other words receives accurate visual impressions of distant objects, without accommodative effort. Such an eye must work in looking at near objects, but every

time it looks away into the distance it has an opportunity for practically complete relaxation, although at the same time seeing distinctly.

In the case of myopia, there is rather general agreement as to the advisability of a full correction being worn, even if the patient does not complain of eyestrain. With regard to hyperopia or astigmatism it is frequently thought unnecessary to furnish a correction to those who do not experience either poor vision or symptoms of eyestrain. Yet there are many who believe that failure to correct any appreciable amount of hyperopia or astigmatism, even in the absence of recognizable symptoms, subjects the patient to an unnecessary drain upon his nervous energy; and, although there are patients in whom we are quite unable to discern any evidence

of deleterious effects from such errors, it may be suggested that a parallel situation, so far as our ignorance of consequences is concerned, exists with regard to dead teeth, which may interfere with the patient's physical economy although he is entirely unaware of the fact.

I can not help believing that any eye which is unable to relax completely in looking into the distance carries some disadvantage to the owner, however minimal that disadvantage may be, and I can not help regarding as nonsense the suggestion that any eye ought to be left a certain amount of uncorrected error for the sake of so-called ciliary exercise. Every eye that possesses the function of accommodation has plenty of exercise in adjusting for varying distances. If so-called ciliary exercise is so essential in distant vision, why not give all emmetropes minus lenses for constant wear, and why not overcorrect all myopes?

What is the purpose of the postcycloplegic test?

Often a postcycloplegic test is a poor substitute for a careful preliminary examination of the patient's refraction. Perhaps the patient, especially if a child, comes in when the ophthalmic physician is very busy. The symptoms indicate a possible need for glasses, and a cycloplegic is ordered. After a cycloplegic examination there is some question as to how much of the correction the patient can be made to wear, and he is requested to return after the homatropin (or atropin) has had time to wear off.

I am almost tempted to say that the most important part of a refractive examination is the preliminary test. Even in the majority of children, this should be carried out and recorded with the utmost precision. With careful use of monolateral and bilateral fogging, the astigmatic dial, and the cross cylinder, some workers would be surprised to find in how very large a proportion of their patients, even in childhood, they could

come within a narrow margin of disclosing at the preliminary test all the error subsequent found under cycloplegia.

Where such a close correspondence exists between the careful preliminary test and the examination under cycloplegia, there is obviously no great necessity for postcycloplegic revision. In some troublesome cases, after a good deal of persistent eyestrain, with more or less ciliary cramp, the cycloplegic test may show an appreciable modification in the astigmatic strength or axis. In such a case, if we fall back on a postcycloplegic examination, we often have to deal with a patient whose ciliary cramp has entirely reestablished itself, and if we rely upon the different result then obtained we may be greatly misled and may lose any real benefit from the cycloplegic.

In many instances, better than a postcycloplegic test is a repetition of the test within a half-day or less of the main examination under cycloplegia. In my experience, many patients after homatropin, and in spite of partially returning accommodation, have shown a steadier condition of relaxation at such a time than at the main cycloplegic test.

It must of course not be denied that there are some patients in whom the presence of irregular lenticular or corneal astigmatism renders it more advisable to base the prescription upon the findings with the undilated pupil. But these are the small minority. Often, too, in such cases the final judgment as to which is the more satisfactory test can not be rendered until the patient has for some time worn the correction found under cycloplegia. In such a case, also, the presence of irregular astigmatism may be further complicated by a considerable amount of ciliary spasm, and the patient's only ultimate hope of breaking up that ciliary spasm may lie in faithfully wearing the correction found under cycloplegia.

To many refractionists the greatest objection to prescribing under cyclo-

plegia is that the patient's accommodation will not ultimately relax sufficiently to enable him to wear a full correction for hyperopia, and that the proportion of his total correction which he can be persuaded to wear may be better determined at the post-cycloplegic test. It is true that, with the most tactful handling, there are some patients who can not be made to exercise sufficient persistence to coax the ciliary muscle to the habit of complete and prompt relaxation which is necessary for the wearing of a full hyperopic correction. It is also true that, after the astigmatic correction has been carefully worked out, there are a few patients who at the postcycloplegic test will accept more of their total hyperopic error than they did at the preliminary examination. But in my experience the latter situation seldom occurs if the preliminary examination was sufficiently painstaking and thorough both as to the measurement of astigmatism and as to careful and deliberate use of fogging methods. And, after seeing numerous cases in which, at the end of a tedious period of apprenticeship with a full understanding of the problem involved, patients have learned to wear with great advantage hyperopic corrections which in the first week or so caused a very annoying distant blur, my own belief is that, in the majority of instances, it is better to take the chance of having to make a later reduction in the hyperopic correction than to face the necessity of either leaving the patient unrelieved of important symptoms or of attempting gradually to build up the proportion of his total correction which he is willing to wear.

I am quite aware that I have occasional failures due to my adhesion to this principle; that is to say, some of my patients fail to persist or fail to return for any necessary compromise; going perhaps to another physician, or to an optician who often discreetly leaves the astigmatic correction as I gave it, but earns a great reputation for skill by a decided cut in the hyperopic correction. But I am just

as certain that I should have some failures under any system, and I believe that by the plan of giving a full correction to the great majority of hyperopic cases I render substantial service to a larger number of patients than if I were to make habitually a radical reduction in the convex sphere found under cycloplegia. To prevent misunderstanding, I may say that I always make a reduction of a quarter diopter plus sphere to allow for the fact that the test is carried out at a limited distance from the chart and that therefore the rays of light coming to the eye from the test letters are not parallel but divergent.

Several years ago I reported a remarkable case of pseudomyopia, in a young woman whose retinoscopic reflex simulated myopia of about five diopters in the right and seven diopters in the left eye. Under atropin, plus 1.25 sphere with a low cylinder gave five-fifths vision, the prescription of course being plus one diopter sphere with the weak cylinder. This patient was not entirely cured of her pseudomyopia until after six months wearing of my correction. I believe the chance of cure would have been appreciably reduced if I had weakened the correction at all upon the basis of a postcycloplegic test, although there were very brief moments of relaxation of the pseudomyopia.

Apprehension as to the difficulty of relaxation to a more adequate correction of hyperopia is often carried to a ridiculous point. I know of one physician, practising in eye, ear, nose, and throat, who persisted in wearing quarter diopter spheres after a manifest test with fogging readily gave twenty-sixteenths vision with plus two diopters sphere.

The postcycloplegic test has a distinct place in refraction work. But it should not be depended upon as a substitute for careful preliminary examination, and it should not be allowed to reduce us to the level of the "optometrist" by destroying the very real advantage obtained from the use of cycloplegia.

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NOTES, CASES, INSTRUMENTS

A VISUAL TEST CARD*

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The recognition of letters and numerals is a complicated process in which the light sense, movements of the eyes, the attention and the intelligence of the patient are all brought into play in order to unite the retinal image of the separate parts of each character. Familiarity with the object, experience, and fatigue have an important bearing on the result of the examination.

It often happens that a patient will distinguish one letter sooner than any of the others of the same size. It is sometimes seen that a patient having once miscalled a letter will go on miscalling this letter even though he recognizes every letter on the next smaller line. These are some of the reasons why it is so often claimed that letters of the alphabet and numerals are unfit objects for testing the visual acuity and that some uniform, standardized figure should be used instead.

Many so-called "universal test objects" have been proposed from time to time; but with these as well as with letters and numerals there are many factors that affect the accuracy of the recorded value of the visual acuity.

Certain factors must be taken into consideration and allowances must be made no matter what form of object is used as a test, and until we have a uniform object which is better than any so far described letters and numerals, if properly constructed to conform to the physiological requirements of a visual test object, offer the best practical means at our disposal of clinically ascertaining the visual acuity. Whether or not this statement is acceptable, tests consisting of letters of the alphabet and numerals are surely a necessary part of the equipment of every office or

hospital where visual acuities are taken.

Probably the most serious fault found with the test cards in use at the present time is the lack of uniformity. The many cards by different authors and by different publishers vary not only in the style of type and the surface quality of the card-board and of the imprint, but in the size of figures which should subtend the same angle. The preparation of an accurate test card is not an inexpensive matter and for this reason, probably, many test cards are still being printed from cuts that were made thirty or forty years or more ago.

The following table is part of the report of the Committee on Standardizing Test Cards for Visual Acuity, of the Section on Ophthalmology of the American Medical Association, in 1915.

Conformity to Snellen standard. Size of letter	
letters of standard size	21
under Snellen standard	19
over Snellen standard	9
imperfect in one dimension	13
Style of letter	
block letters	17
gothic letters	6
Character of background	
white glazed	2
white semiglazed	8
white matte	11
yellowish white or cream matte	9
black matte	2
Imprint of letters	
clear	21
not clear	9

Add to these inconsistencies the lack of a standard of illumination of the test card itself and of the color and illumination of the room in which the test is made, and the confusion is indeed great. The value of a record of the visual acuity depends on the uniformity of the test card and on

METERS
40

B

30

R C

25

D H U

20

U S D C

16

E R C B

12

D S U H O E

10

E O H U B C

8

U S O R C H

6

S C E U B O

5

O E C H D R

4

H U E D S O

3

C S O R U H

Fig. 1 (Cowan). Visual test card.

the conditions under which the test is made.

The nine letters used in the accompanying card were previously suggested in an article published in the *American Journal of Ophthalmology*, August, 1928, p. 625. They are so constructed that not only the bars, stems and arms subtend an angle of one minute, but also the spaces between them subtend the same angle. Each letter was carefully drawn and then reduced by photography to the proper size. The result is a series

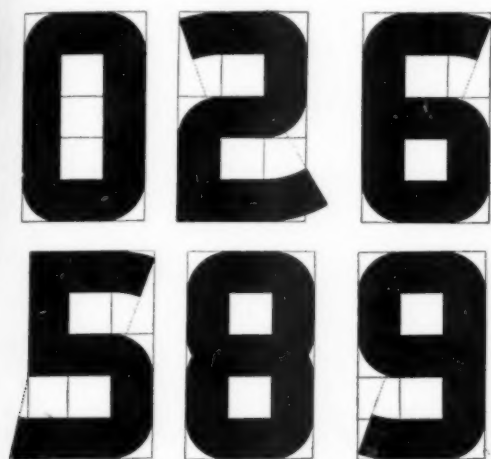


Fig. 2 (Cowan). Number test type.

of letters of very nearly equal legibility.

A similar test card is being prepared with numerals which have been drawn to the same specifications as the letters. Each figure is nearly contained in a rectangle subtending an angular distance of three minutes in width by five minutes in height.

The letters on the card are widely spaced so that each may stand out as an individual test object and so that fatigue may be eliminated as far as possible. They are arranged for distances of 3, 4, 5, 6, 8, 10, 12, 16, 20, 25, 30, and 40 meters. This gradation follows very closely the geometric progression proposed by Green, but the distances are so chosen that both the numerator and the denominator

of the Snellen fraction may be given in round numbers.

The cards are printed in what is known as four-color process black ink on selected ten-ply, pasted cardboard with a smooth flat white surface.

2007 Pine street.

SUPERFICIAL NECROSIS OF ENTIRE CORNEAL SURFACES AFTER GAS EXPLOSION; COMPLETE RESTORATION*

BURTON CHANCE, M.D.
PHILADELPHIA

On the morning of the twenty-sixth of September last, at 9:20, the building in which I have my office was shaken by an explosion from within. While bracing myself for I knew not what, I was aroused by the cries of the janitress in the passage outside my private door, and the groans of someone with her. On opening the door, I found the slight little woman holding up her burly assistant, who cried out that he had been blinded and was suffering great pain in his eyes.

I led them to my chair. The quite stupefied negro was not able to open his eyes, from which great quantities of tears streamed. On separating his lids I found the corneas dull and gray, appearing altogether like dead eyes, as though post-mortem changes had taken place in them. The right was more densely marked than the left.

On quieting the very much frightened and shocked man, I learned that he had gone down to force the furnace fires, the weather being, on that day, quite unexpectedly cold, when he discovered that the pilot light of the gas-heated water boiler was not burning. He therefore sought to relight it with a match. He was stooping down looking with both eyes into the hole and guiding the burning match in the passage leading to the tiny

* Read at the Section on Ophthalmology of the College of Physicians of Philadelphia, January 17, 1929.

tube when suddenly the explosion occurred. He received a blast in his face; he could not tell whether or not he was knocked down; his cries brought the frail woman to him and she led him to me.

Soon it was possible for me to examine him more thoroughly. Evidently he had received the force of the violently projected column of air directly on the exposed surfaces of his two eyes, the corneas of which were bruised; in effect devitalizing the epithelial coverings, into which also flecks of dust had been driven.

After flushing the eyes with an alkaline lotion and copiously running in a solution of holocain, I bound them up for a short time. On removal of the bandages, there were seen membranous shreds and fine dusty particles in the tears, while the surfaces of the corneas were eroded, somewhat map-like. I again bound up the eyes for two hours, and on the removal of the bandages more shreds, flakes, and strings were washed away, the corneas having regained some of their sparkle. The eyes were again flushed, and were soaked with holocain, and the man went upstairs to bed. By four o'clock he had had a good sleep; and he awoke quite free from pain and was able to see more or less clearly. I then sealed the lids with court plaster and put him back to bed, where he spent a comfortable night, and on the next morning inspection showed a marked improvement of his condition. On the next

day only here and there could be seen areas denuded of their epithelium.

On the third day, the twenty-ninth, the lachrimation was scanty, the surfaces sparkling and less painful; the man being able to read 4/15 with the right and 4/9 with the left eye. By the third of October, the end of the seventh day, he could stand the light and he was able to go about without smoked glasses. In the meantime lotions and solutions of holocain were used by myself daily, and the edges of the lids anointed with bichloride vaseline. Yet not for another week was he free from pain, discomfort, and a profuse lachrimation. On the thirteenth of October, the seventeenth day, I considered him as having quite recovered, and he was discharged from further attention, the visual acuteness being perfect.

At no time did the laminas appear to be implicated, neither was there affection of the irises nor disturbance of the lenses, and the funduses were perfectly healthy.

The case reminded me of certain others where the cornea had been superficially burned by a jet of steam driven under moderate pressure; and of others where a jet of compressed air, such as is in tool pipes, had been driven into the workman's face.

The restoration of the epithelium in so short a time after complete denudation indicates the recuperative powers of wounded tissues under aseptic conditions.

315 South Fifteenth street.

SOCIETY PROCEEDINGS

EDITED BY DR. LAWRENCE T. POST

NASHVILLE ACADEMY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY

December 17, 1928

DR. HERSCHEL EZELL, chairman

Albuminuric retinitis

DR. HERSCHEL EZELL presented the case of Mr. A. L. M., aged fifty-three years, who was referred on October 14, 1928, because of spots before his right eye and impaired vision. The patient's general health had been good and his only complaint had been about his right eye. The family history was negative. He had noticed a defect in the right eye for three or four years. The spot, or spots, were circular to the patient and extended toward the right side. Both eyes were normal in appearance; pupils of usual size and reacted normally to light and accommodation. The vision in the right eye was 20/70 and in the left 20/20. Homatropin was instilled in both eyes, after which ophthalmoscopic examination revealed a large area of retinitis in the right eye in the macular region. This area was of large dimensions and of pale white color with here and there small hemorrhages. The papilla was normal and the retinal vessels also. The urinalysis showed albumin four plus, the blood pressure 220 and 240 mm. Wassermann was negative.

Discussion. DR. W. G. KENNON said that a unilateral albuminuric retinitis was a rather rare condition but he did not question the diagnosis, although the history indicated that the man had it for four years, which was by three years beyond the usual life after finding this trouble.

It was hard to distinguish between albuminuric retinitis and the choked disc which suggested brain tumor or abscess. Dr. Park had observed several years ago that with increased intracranial pressure the choking was greater in the eye with the lesser

tension. Dr. Orr and Dr. Kennon had had a patient with intraocular pressure of forty mm., and blood pressure high. Miotics had reduced the tension to about normal but the patient promptly developed an albuminuric retinitis. Dr. Kennon had never seen a case he thought to be unilateral albuminuric retinitis. This man's left eye should be watched. He had never observed a patient with albuminuric retinitis without high blood pressure. There was danger of believing that because a man had albuminuria this was the basis of all his troubles.

W. W. WILKERSON, JR.,
Secretary

COLORADO OPHTHALMOLOGICAL SOCIETY

November 17, 1928

DR. EDGAR F. CONANT presiding

Steel fragment in lens

DR. DAVID A. STRICKLER presented Mr. A. E., a mechanic, aged thirty-three years. On October 30, 1928, while removing a piston pin with a hammer and punch, the patient felt something strike the right eye. There was very little pain at the time but "water came out of the eye." Examination showed a corneal perforation two millimeters in length, slightly temporal and below the center, extending in the direction of 7 o'clock. A piece of bright metal was seen in the lens at the outer margin of the pupil, pointing into the anterior chamber. The iris was not injured nor in contact with the fragment.

At operation, the original wound was enlarged, and the foreign body drawn forward to the cornea by a hand magnet held in front of, but not in contact with, the cornea. The point of a scissors was introduced through the corneal wound and the magnet now applied to the scissors.

The foreign body came away with the scissors. Cyanide of mercury, ten minims of one to 2,000 solution, with atropin was injected subconjunctivally. At the present time, November 17, 1928, the eye was red and irritable. There was lens substance in the anterior chamber. Some had been absorbed.

Discussion. DR. FRANK R. SPENCER and DR. WILLIAM H. CRISP thought that a keratome incision followed by a washing out of the lens substance was advisable. Perhaps needling might be necessary later.

DR. STRADER had used for this purpose a suction apparatus devised by Dr. Dean of Council Bluffs, Iowa.

DR. EDWARD JACKSON said that although broken up lens material did keep up inflammation and irritation, surgical interference should depend upon the length of time that the inflammation had persisted. In this case the lens was greatly broken up, but broken up lens in capsule frequently did not keep up irritation. The removal of lens material was helpful, but this eye was becoming quiet and therefore surgical interference should be delayed.

Ptosis: Tansley-Hunt correction, the remote result

DR. FRANK R. SPENCER showed Mr. E. H., aged thirty-nine years. In September, 1916, he had done a bilateral operation for congenital ptosis by the Tansley-Hunt method. At the present time the upper lids covered the upper third of the pupillary area of the cornea, even when the frontalis muscle was used to elevate the lids. At the time of the operation it was impossible to correct the ptosis more than this and at the same time permit proper closure of the lids. The patient now had good lid closure, but it was doubtful if he would have had this if the upper lids had been elevated by surgical interference to a greater extent. The patient had been presented to this society several years ago. At that time one of the members believed that the epidermis

should have been removed from the pedicle in order to avoid the danger of an epidermal cyst. The result had been entirely satisfactory for the past twelve years.

Congenital cataract, needling

DR. SPENCER also brought Master T. B. aged nine years, whose vision prior to needling had been 2/60. There were fine dust-like vitreous opacities. The vision with a plus 15.00 sph. was 6/4—3.

Discussion. DR. WILLIAM M. BANE asked as to the age of preference for needling a congenital cataract.

DR. SPENCER replied that he had done a few as early as two years of age.

DR. EDWARD JACKSON was disposed to wait three or even five years because there would be no probability of hindrance to the vision or mental development, even if the cataract were complete.

Hyperopia resulting from loss of vitreous

DR. JAMES M. SHIELDS exhibited two cases to illustrate the change in refraction due to vitreous loss. The first patient, Mr. L. H., aged nineteen years, had been shown before this society last spring. The sclera of the left eye had been ruptured about four millimeters below theimbus and a little to the temporal side, by a flying pheasant which came directly through the wind shield and struck the left eye. A very considerable amount of vitreous was lost. The scleral wound was covered by a conjunctival flap, atropin was instilled, the patient put to bed, and milk injections given. The eye made an uneventful recovery.

The second patient, Master W. A., aged twelve years, on October 4, 1928, was tapping a loaded number twelve cartridge with a heavy pocket knife, when the shell exploded and a piece of it about four millimeters in diameter, almost flat and with jagged edges, went through the lower left lid, just above the lower orbital margin. It penetrated the lid and made an

incised wound through the sclera about five millimeters below the lower limbus, permitting the escape of vitreous. No uveal tissue presented through the wound. The scleral wound was horizontal, about four or five millimeters long and as straight and clean as if made with a cataract knife. It was covered by a conjunctival flap. Under atropin and dionin the eye made an uneventful recovery. There was slight retraction of the iris below.

Both of these left eyes in the two cases presented had good vision with lenses, but both had required the use of plus lenses greater than the fellow eyes, presumably because of vitreous loss with resulting lessening of the size of the globes. The refractions were as follows: Case 1, vision C.D. 20/16 with plano; O.S. 20/24 with plus 1.50 sph.—0.25 cyl. ax. 135°. Case 2, vision O.D. 20/16 with plus 1.00 sph.—0.25 cyl. ax. 120°; O.S. 20/20 with plus 2.75 sph. 0.25 cyl. ax. 60°.

Discussion. In reply to Dr. Spencer's question as to whether any vitreous opacities had developed. Dr. Shields said that the vitreous was perfectly clear in both cases.

"Mulberry" macula

DRS. WILLIAM C. and WILLIAM M. BANE presented Mr. D. C. L., aged seventy-two years. This patient was first seen in May, 1919, complaining of failing vision of the right eye for two or three months. The left eye had been injured about forty years previously and had never had good vision since. The examination in 1919 showed the vision of the right eye to be 5/20—1, and that of the left eye the hand as a moving object at one foot. The lens of this eye was cataractous. The media of the right eye were clear and no pathology was noted in the fundus. With a correcting lens the vision in the right eye was improved to 5/10.

The patient was next seen in March, 1923, complaining that the vision of the right eye was worse.

Examination showed the vision to be reduced to 5/60—, but with correction it was improved to 5/10. In February, 1925, he could read only large type at night. His glasses improved the vision to 5/15—. At this time, a small area of degeneration with a dark center was noted in the macula. In March, 1927, the vision with correction was reduced to 5/30+. The patient reported again November 13, 1928, stating he could no longer read the newspaper. With his glasses he could read 5/30 with great difficulty. The right cornea, lens, and vitreous were essentially negative, but it was observed that the right macula was not normal in color, there being seen here a round red area about one-fourth the diameter of the optic disc in size, with margin sharply defined, seen better with red-free light, and about on a plane with the surrounding retina. The blood pressure at present was 190 mm. systolic, 120 mm. diastolic. The urine showed a trace of albumin, but no sugar. The teeth were bad and needed attention or extraction.

Discussion. DR. WILLIAM H. CRISP thought that the pathology of the picture was perhaps a breaking down of choroidal vessels with development of a cluster formation of new-formed vessels.

Senile macular degeneration

DR. WILLIAM C. FINNOFF showed Mr. W. O. S., aged fifty-six years, a traveling salesman. He was seen first June 15, 1928, with a history of failing vision in the right eye of two months duration. The vision of the left was unchanged. Outside a refractive error, the eyes had always seemed good. There was no history of previous trauma, inflammation, or illness of consequence. Vision with correction was, right 20/100, left 20/50. Ophthalmoscopic examination revealed in the right eye a slight vitreous haze and a waxy yellowish disc with indistinct edges. Slightly above the macula an oval slaty-red area of chorioretinal infiltrate, about one-fourth disc diameter

across, was noted. The area did not seem elevated and the small vessels passed over its surface. The lesion suggested a cellular exudate in the choroid with early disintegration of the pigmented epithelium. A central scotoma was found. In the left eye extensive changes were found in the macular region. There was a round area with a light center and finely pigmented border, and an oval area about one-half its size, surrounded by dense pigment, extended to the temporal side. In addition, several areas were seen in which the pigment had been absorbed. The vessels were fair. The Wassermann reaction, prostate gland, urine, and teeth were negative. The maxillary sinus on the right side was slightly cloudy to x-ray; the tonsils were infected and tenderness was found over the gall bladder. The tonsils were removed and the antrum drained without improvement in the eye condition.

At the present time the vision of the right eye was 20/200, left 20/60. The lesion in the right was darker than it had been in June. It was now slightly elevated, and several drusen were present in the upper temporal portion of the macula. A very small oval yellowish area had appeared at the nasal margin of the original lesion just above the horizontal meridian. The left eye had remained stationary.

Congenital absence of left abduction

DR. W. A. SEDWICK showed a ten year old girl whose ocular history was otherwise negative, but whose left eye could not be voluntarily rotated outward beyond the mid-line.

Intraocular steel fragments

DR. WILLIAM H. CRISP discussed four recent cases of hand magnet extraction of intraocular fragments. In two cases the fragments had been unusually large, and in each of these cases the fragment had lodged at the back of the eye very close to the optic nerve. In one of these two cases the lens was uninjured and the

fragment could be seen lying in the cut choroid close to the nerve entrance; while in the second case the lens was cataractous but x-ray localization indicated a similar position. In the first case the foreign body had been extracted the day after the injury, through a scleral incision, and the following day a profuse flow of exudate had developed through the passage of entry of the foreign body, that is through the iris and cornea. It had ultimately been necessary to remove this eyeball, and it appeared likely that the eye might have to be removed in the second case, although in this eye the secondary inflammation had been more sluggish in character. In the second case a very thick band of fibrous tissue had developed in the line of entry of the foreign body, between cornea and iris and lens. Should an attempt be made to cut this band because of its possible influence in maintaining inflammation?

From the operative standpoint, the most interesting case had been one in which an extremely delicate filament of steel, four millimeters long, had penetrated the eye after being thrown off from the edge of a die in which a punch was being set with a lever. A portion of this fragment was barely visible in the angle of the anterior chamber, and x-ray localization by the Sweet method had shown the foreign body to extend through the cataractous lens almost to the posterior pole of the lens. The wound of entrance was through the conjunctiva just outside the limbus. On account of the risk of entangling the foreign body in the iris if a blind attempt were made to remove it with the magnet, the partially healed conjunctiva had been elevated, the tiny puncture in the sclera felt for with a blunt point, and a small Graefe knife then introduced through the wound of entrance into the angle of the anterior chamber, a short incision being made first downward and then upward from the point of entrance. Narrow, blunt-pointed scissors were then held closed, barely within the lips of this surgical open-

ing, in line with the linear foreign body, the magnet tip held against the scissors, and the current turned on; the foreign body being immediately withdrawn.

Retrobulbar neuritis

DR. DONALD H. O'ROURKE presented Mr. H. Y., aged twenty-four years, whom he had first examined on October 23, 1928. The patient had complained of gradual loss of vision in the left eye, noticeable over a period of two days, at the end of which time the vision was lost entirely. He was first examined eight days after the beginning of his trouble. The right eye was normal in all respects and the vision was 6/6+. The left eye was without perception of light; the pupil reacted to light promptly but this reaction was poorly sustained. The rotations of the globe were full in all directions and occasioned slight pain, as did also backward pressure on the globe. The ophthalmoscopic evidence of pathology was extremely meager. There was questionable swelling of the disc, between one and two diopters, with faint obscuration of the nasal margin, certainly very little evidence to account for a blind eye. The patient was in good health. His blood picture was normal; urinalysis negative; blood and spinal fluid Wassermann negative. There had been no recent illness of any nature. The medical and neurologic consultations gave no help.

X-ray examination of the sinuses showed sufficient evidence to warrant surgical interference. A submucous resection was done, and left turbinectomy of the middle turbinate: the left posterior ethmoid cells were exenterated and the left sphenoid sinus drained. On October 29, the right antrum, sphenoid, and ethmoids were drained. The patient was discharged from the hospital on November 13, 1928. On November 14, vision O.S. was 6/20; the swelling of the disc was gone but the nasal margin was hazy. The temporal half of the disc was paler than the corresponding part

of the right disc. On November 24, vision O.S. was 6/6+; the peripheral field was very slightly contracted; there was a relative central scotoma for red and green of indistinct outline.

The etiology may have been the affected sinuses but the picture was possible as an early manifestation of multiple sclerosis.

Discussion. DR. WILLIAM C. FINNOFF cited a case which he had followed carefully. The first attack acted very similarly to the case just described, but nine months later a second attack of retrobulbar neuritis was accompanied by paralysis of the ipsilateral sixth nerve. The vision again improved, but subsequent attacks and developments definitely established the diagnosis of multiple sclerosis.

DONALD H. O'ROURKE,
Secretary.

OMAHA AND COUNCIL BLUFFS OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY

November 20, 1928

DR. DONALD OWEN, chairman

Episcleritis

DR. JAMES M. PATTON showed an unusual case of inflammation of bulbar conjunctiva and episcleral tissue in a man of seventy-five years. Starting with a small area of hypertrophy near the upper limbus, this had spread over nearly the whole bulbar conjunctiva, which had become inflamed and somewhat thickened. A number of small ulcers of the cornea had occurred. The condition had remained stationary for three months after a course of treatment, but lately had recurred again. The Wassermann was negative and the most likely focus of infection was a suspicious ethmoiditis. Radium, phototherapy, and dionin seemed to be without much effect on the condition. Sections of a small piece of tissue removed showed chronic inflammatory changes.

Corneal ulceration and iritis

DR. L. B. BUSHMAN showed a case of corneal ulcer following injury, complicated with severe iritis. Ordinary treatment was unsuccessful in dilating the pupil. Typhoid vaccine was given intravenously, and following the second treatment the pupil dilated markedly. The condition had cleared up steadily ever since.

Tendon tuck for strabismus

DR. C. M. SWAB showed the result of a muscle operation performed on a girl of fourteen years, three and a half years before. A tuck of each external rectus was done. The eyes appeared perfectly straight and the sites of the tucks were almost imperceptible. There was exophoria of twelve centrad for distance but no diplopia.

Dyspituitarism following trauma

DR. SWAB showed a man of about forty-five years who gave an unusual history of dyspituitarism following an automobile accident six months ago. Since the accident he had gained ninety pounds and had become somnolent, and the vision had failed markedly. The field showed concentric contraction. On combined pituitary and thyroid extract there was a marked increase in the fields, fifty-nine and one-half pounds were lost in a short time, and all the symptoms of dyspituitarism were markedly relieved.

Amaurosis from trauma

DR. HAROLD GIFFORD showed a man who had injured his right eye by running into the end of a fish pole a week before. At the time of the injury he had bled from the nose. The whole lower bulbar conjunctiva was practically absent and there was much chemosis. There was no light perception in the eye. An ophthalmoscopic examination showed vitreous opacities and a picture suggesting closure of the central retinal artery. X-rays revealed no foreign body in the orbit, but the question

was brought up whether or not the orbit ought to be explored.

Prevention of complications in cataract operations

DR. HAROLD GIFFORD gave the main points of a conference which he had held on this subject in the postgraduate course of the American Academy meeting in Saint Louis. He expressed himself as a believer in the capsulotomy operation under conditions met with in this country, because he felt that a secondary discission when necessary was much safer than the added risk of loss of vitreous involved in the intracapsular operation. He believed in the advantage of the conjunctival flap, which he made with a knife, putting in two sutures as soon as the flap was completed if any complications were expected. Where the vitreous was known to be fluid, a sliding conjunctival flap was prepared from above after the manner of Kuhnt and the stitches placed before the incision was made. Immature cataracts, when it was necessary to remove them, were expressed in the ordinary way, but irrigation of the anterior chamber was avoided in these cases as it increased the reaction. Naturally considerable time was allowed to elapse before the discission which was necessary in about seventy per cent of these cases.

Instruments used in cataract operations, many of which had been modified to suit the operator's needs, were demonstrated, including the fixation forceps with teeth for obtaining fixation on either the superior or internal rectus or both. The collection also included a loop for removing a dislocated lens, to which the author had added four hooks pointing upward which greatly increased the certainty with which the lens was engaged and obviated the necessity of pressing it forward against the cornea.

Discussion. DR. F. W. DEAN emphasized the necessity for protecting every patient against loss of vitreous caused by squeezing the lids. He used the method of akinesia of

O'Brien, injecting the facial nerve at the temporomandibular articulation, and had been very pleased with the results. He made a conjunctival flap with scissors and placed stitches in the edge of the flap before making the incision. In case the iris prolapsed in front of the knife he removed the knife and inserted a dulled cataract knife with a point to make the counter puncture after which the incision could be finished with original knife without cutting the iris. He performed a cystotomy with a cystotome. As soon as the lens had been expressed the stitches in the conjunctival flap were tied and the iris replaced.

DR. J. W. BANISTER mentioned the value of the Smith lid hooks and the Smith needle to help in removing the lens without exerting intense pressure.

D. J. M. PATTON emphasized the value, for operators who do only a limited number of cataract operations so that they are not absolutely sure of making a good conjunctival flap with a knife, of the sliding conjunctival flap from above described by Kuhnt, which he used as a routine in his operations.

BROOKLYN OPHTHALMOLOGICAL SOCIETY

December 20, 1928

DR. ROBERT M. ROGERS presiding

Glaucoma problems

DR. ALLEN GREENWOOD of Boston, in defining glaucoma, considered it nothing less than hypertension. Its division into various types was simply one of degree. Chronic glaucoma might be congestive or simple, the former having a shallow anterior chamber and lending itself to treatment with miotics; the latter having a normal anterior chamber and not yielding readily to treatment. He stressed the importance of making an early diagnosis, emphasis being laid on the fact that the field defects were not apparent before cupping set in.

The best indication of increasing hypertension was advancement in the field defects. The testing of light sense was of great value to determine a preglaucomatous stage. Regarding nonoperative treatment, the younger the patient the less likely was it that the vision could be maintained throughout life by means of miotics. For continued use, pilocarpin was better than eserine.

In outlining the operative treatment, the trephining operation was considered the surest for reducing tension in the majority of cases. The author described his operation for chronic glaucoma, which is a modification of the Lagrange.

In discussing secondary glaucoma, the speaker said that anything which mechanically blocked the angle of the anterior chamber might be the cause. One of the most frequent causes was subluxation of the lens. In these cases miotics should be employed and atropin was contraindicated. In the cases of secondary glaucoma after cataract extraction or following discission, simple iridectomy should be performed. Those cases due to chronic iridocyclitis were very difficult to handle. In acute iritis with high tension, atropin was indicated. Leeches applied to the temple also helped. At times paracentesis might be necessary in these cases.

Monocular diplopia

DR. DAVID POE presented a case with no positive findings. The patient, a young woman about twenty-two years old, had had lethargic encephalitis several years before.

Epidermoid carcinoma

DR. CHARLES A. HARGITT reported, in a patient sixty-seven years old, a case of tumor involving most of the lower lid. The tumor had been developing for four years, and measured 28 mm. in diameter. The pathological diagnosis was epidermoid carcinoma.

Sarcoma of iris

DR. I. KRUSKAL reported the case of a man fifty-two years old, with

a mass in the iris of the left eye. Wassermann and x-ray were negative. The tentative diagnosis was sarcoma.

WM. F. C. STEINBUGLER,
Secretary.

ROYAL SOCIETY OF MEDICINE, LONDON

Section of Ophthalmology

December 14, 1928

MR. CYRIL WALKER, president

Retinal hemorrhages

MR. W. H. McMULLEN showed a girl, sixteen years of age, who had retinal hemorrhages for which no cause could be found. Her blood pressure was normal, and physicians regarded her as normal. There was one hemorrhage on the disc, and another below. Blurred sight occurred when a menstrual period was ten days overdue.

Embolism of branch of central artery of retina

MR. W. H. McMULLEN showed a case of this kind which had a restoration of circulation, but the patient had fairly frequent transient loss of sight in the other eye. She took a tablet of nitroglycerine when she got an attack of obscuration.

Flap sclerotomy for glaucoma

SIR RICHARD CRUISE showed a man on whom this operation had been performed, exhibited as an instance of satisfactory termination of the operation for glaucoma. The scar was perfect; aqueous was escaping from the anterior chamber, however, and the only explanation he could give for this was that it was due to admixture of endothelial cells with ordinary scar tissue. There was no cause for anxiety when a case started to filter in this way.

Diffuse corneal opacities

MR. GEOFFREY VINER showed a case of diffuse corneal opacities, the

patient being a married woman aged twenty-six years. The slit-lamp did not reveal any inflammatory basis for the opacity. There were no changes in the cornea, no blood vessels, and the opacity was homogeneous. Each eye had five diopters of hypermetropia, and with correction vision was 6/9. He regarded the condition as congenital.

Juvenile tabetic paralysis

MR. GEOFFREY VINER also showed a case of juvenile tabetic paralysis, in a man aged twenty-four years. In the last six months there had been a rapid failure of sight, due to optic atrophy, and marked contraction of the fields. He had been treated for three months by malaria infection, without improvement of vision.

Pituitary tumor

MR. MONTAGUE HINE exhibited a woman who had had a pituitary tumor removed with very satisfactory result; the scar was not very marked. Mr. Broster had done the operation. Afterward vision increased from 6/36 to 6/9 in the left eye; there was no alteration in the other eye.

Hole in macula

MR. MONTAGUE HINE also showed a man with a hole at the left macula. In 1918 he had had an injury which resulted in loss of central vision in that eye; the peripheral field was good. Nine years later he developed optic neuritis in the right eye, the working eye, and was under care at Moorfields for seven weeks. No x-ray evidence of a skull fracture was forthcoming. The affected eye had a definite cupped disc, and the exhibiter asked whether the eye condition could be related to the long-past history.

Disc abnormality

MR. MONTAGUE HINE also showed an old man with glaucoma in the right eye; a like condition was present in the left eye, with hemorrhages. Also, under the right optic disc was a slate-colored oval patch.

Blue deposits in cornea

MR. T. HARRISON BUTLER showed a man who with a slit-lamp revealed bright blue changes in the deep layers of the cornea. There had always been irritation in that eye, and the man had been treated for chronic conjunctivitis. There was no history of a foreign body, which might have offered some explanation of the appearances.

Crystalline deposits in cornea

MR. C. GOULDEN showed a patient with an extensive crystalline deposit in the cornea, a sequel of prolonged inflammation. The case had come under his care in 1924, when there was a deep keratitis in the left eye, rendering the cornea quite opaque. Wassermann was negative. Under atropin the condition increased. Perhaps ultraviolet light baths would be beneficial.

Copper cataract

MR. GOULDEN also showed an instance of the rare condition copper cataract; he had seen only one such case previously. A piece of metal entered the eye in 1916, and the sight was lost. The cornea was almost completely obscured by vesicles on its surface. The lens had practically disappeared, and the eye was quite blind. Examined in the direct path of reflected light, the lens gave the impression of a polished copper utensil.

Rodent ulcer

MR. A. D. GRIFFITH showed a case of rodent ulcer between the eye and nose which had been given six applications of radium, at weekly periods, a total of 600 milligram hours. A fortnight after the last application there was complete healing with a supple scar.

Corneal ulceration from mustard gas

MR. F. HECKFORD showed a case in which corneal ulceration had ensued ten years after mustard gas burns of the eyes had been sustained.

Pigment at macula

MR. M. WHITING showed an unusual pigmentary change at the macula in a woman aged sixty-four years. It looked like melanoma of the ordinary type, but the pigmentation seemed too dark for that. Five years previously she had been struck in the eye by a piece of wood. There appeared to have been some hemorrhage, followed by migration of pigment in that area. The defect of vision was due to a high degree of myopic astigmatism, which until recently had remained uncorrected.

(Reported by H. Dickinson)

MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARNGOLOGY

January 9, 1929

DR. W. L. HOWARD presiding

Plastic repair of ectropion

DR. R. O. RYCHENER presented Miss T.B., nineteen years of age, who had been operated on for correction of ectropion and of divergent squint of 22 degrees. During infancy the patient had fallen striking the right orbital rim, with resulting osteomyelitis and partial loss of the lower and outer orbital margins. This caused cicatricial ectropion of the lower lid and divergence and lowering of the right eye, which was amblyopic. The ectropion was corrected after the technique of Wheeler by a Thiersch graft over a wax mold, and three weeks later resection of the right internus with tenotomy of the externus was performed. There was still a slight undercorrection of the squint. It was proposed to correct the sunken appearance of the right orbital floor by a cartilage or bone graft, after which any remaining defect in the extraocular musculature could be remedied by tenotomy of the left externus.

Discussion. DR. P. M. LEWIS congratulated Dr. Rychener on the result,

but wondered if there might not be too much skin at the completion of the subsequent graft. He suggested the use of fascia lata graft instead of cartilage. He had assisted Dr. John Wheeler in the implantation of several of these grafts and found that they did well.

DR. D. H. ANTHONY thought the result excellent. He wondered if upward dissection was the best route through which to implant the subsequent bone or cartilage graft. The skin over the site was so exceedingly thin that there might be some question of its viability over the subsequent implantation. He suggested a higher route of implantation through an incision in the lower cul-de-sac.

Orbital cellulitis and panophthalmitis

DR. M. B. SELIGSTEIN presented a case of orbital cellulitis and panophthalmitis, resulting from an attempt to gouge out the eye. Mr. I. S., aged fifty years, was first seen on October 6, 1928, with the history that on October 3, following an automobile collision, he had been set upon by an intoxicated occupant of the other car who attempted to gouge out the right eye with his finger. The patient was seen by Dr. A. B. Dancy, who put a black silk suture in a tear of the conjunctiva of the lower lid at the inner canthus.

On examination there was marked exophthalmos of the right eye, the globe almost protruding between the lids. No injury to cornea or bulbar conjunctiva was seen, but a lacerated wound of conjunctiva below at the inner canthus presented. The fundus seemed clear. The patient was hospitalized immediately. Atropin one percent was used three times daily, dionin five percent twice daily, and hot applications of saturated solution of magnesium sulphate. The cornea was covered with atropin ointment.

On the fifth day of infection fluctuation was felt, and three incisions through the upper lid just above the eyeball and two incisions through the

lower lid below the eyeball were made, with insertion of rubber tissue for drainage. About the tenth day sloughing of orbital structures, cornea, iris, lens, and sclera began, continuing until the inner two-thirds of the upper lid was involved and there was loss of the tarsal plate. The middle of the lower lid sloughed out, and the outer third lay on the outer rim of the orbit. Further treatment consisted of wet dressings of S.T. 37 (hexaresorcinol) undiluted, and irrigation of the orbital sinuses with the same solution.

The smear showed a short chain streptococcus.

There had been no pain associated with the case at any time, except when the posterior part of the sclera was cut off. The pain then may have been due to the severe edema.

Discussion. DR. STANFORD, as soon as the discharge ceased entirely, would dissect the upper lid, as no other plastic procedure could be followed.

DR. JOHNS stated that he had seen this case about the third day, when there was considerable bleeding, and he attempted to remove the stitch which had been placed in the conjunctiva by Dr. Dancy. There was so much edema present that the stitch could not even be seen. He had noticed in his experience that a finger nail infection was a very virulent one.

DR. HAMRICK had seen this case with Dr. Johns. There was marked swelling and exophthalmos present. The pus was streaming through the wound in the conjunctiva, and the infection must have been very virulent and destructive.

DR. SELIGSTEIN said Dr. J. H. Collins stated that he had seen quite a few of these cases in Maine twenty years ago. They occurred in fights between English and French Canadians, whose favorite method of attack was an attempt to gouge out each other's eyes.

Corneal laceration with iris prolapse

DR. A. C. LEWIS presented a case of penetrating wound of the eye, with iris prolapse. O. L., colored man aged 25 years, had been struck in the left eye by the point of a nail on December 20, 1928. The eye was quite painful that day, but comfortable the next, and when first seen on December 26 vision was normal and the eye was causing no discomfort. Examination showed a perforation at the limbus about two o'clock with an iris prolapse half the size of a small pea. The pupil was conical in shape, the point of the cone extending almost to the wound.

On December 31, eleven days after the accident, the patient entered the hospital. After separating the prolapsed iris from its adhesions to the wound margins, an attempt was made

to excise it. While holding the iris with forceps, and just as the de Wecker scissors were closing, the patient turned the eye sharply to the right. This movement caused removal of a larger amount of iris tissue than was intended or necessary, and the sphincter pupillæ was about all that was left at this point. The vision was still normal, and there was no monocular diplopia in this eye, as had been feared might result from the double pupil.

Discussion. DR. R. O. RYCHENER thought the result was perfect. The iris pillars were free, the eye was quiet, and it was impossible to detect an iridectomy until the upper lid was elevated. The polycoria would probably never cause any trouble.

R. O. RYCHENER,
Secretary.

American Journal of Ophthalmology

PUBLISHED MONTHLY BY THE OPHTHALMIC PUBLISHING COMPANY

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AN ASSOCIATION FOR RESEARCH IN OPHTHALMOLOGY

In 1920 a group of neurologists and psychiatrists, members of the New York Neurological Society, formed the Association for Research in Nervous and Mental Disease. The founders of this organization felt that the existing societies did not accomplish as much as was possible in the development of the specialty, particularly as regarded research. The new association was to meet annually for discussion and presentation of papers on a single subject chosen several years in advance, the various subdivisions of the subject being assigned to investigators who had already devoted study to the particular topic allotted to them. The organization consisted of the usual officers plus a board of twenty commissioners who chose the subjects for the yearly sessions. Twenty-minute papers were to be presented, followed by open questioning by the commissioners and then by any member of the society. The papers and dis-

cussions were to be published yearly.

The association has met annually in New York since 1920, and during that time six volumes have been published by the association. These are considered of great value in bringing the knowledge of the subjects studied up to date. A compiling secretary is appointed annually, and he collects during the following year any new or important material which is published on the subject assigned. This material is later added as an appendix to the association's transactions on the subject.

The proceedings are distributed to each member of the organization. Membership is limited to those whose principal interest is in the specialty. Practically, the association is open to any specialist interested. The formal qualification is membership in a recognized neurologic or psychiatric society; but this rule is not strictly adhered to, because it would exclude some young investigators who had not yet been able to join the older societies.

The annual dues are ten dollars. Thus far the attendance has been satisfactory, and the general opinion has been that the association was accomplishing a worth-while purpose.

The idea of an association for research in ophthalmology along similar lines occurred to Dr. Conrad Berens, who accordingly wrote to a number of ophthalmologists in 1925 about this proposal. In 1928, a large number of favorable replies having been received, a meeting was called in Washington to discuss the formation of such a society. Temporary officers and a board of trustees were appointed. Further action was deferred until the meeting of the American Medical Association in June of the same year. Most of those who met to discuss the subject at that time were favorable to the idea, but it was felt that further deliberation was advisable. Therefore the board of trustees appointed in Washington was authorized to consider the matter and to make recommendations.

The formation of a new society is a matter not to be entered upon lightly. Will such an organization accomplish something which can not be accomplished by one or other of the societies already in existence?

A comprehensive symposium on one subject prepared over a period of several years can not fail to be valuable, but whether much new material will be produced is extremely doubtful. If there were a large number of scientifically trained research workers, the assignment to them of special problems might lead to fruitful discoveries, but the available number of those who are already working on each problem is small, so that many would have to be called from other fields of scientific labor. In general it would seem that the assignment of special investigation to a worker would result in his being able to present a valuable summary of the work already done, with a critical analysis of it, rather than any important original contribution. Occasionally such a contribution might, how-

ever, be forthcoming. Unfortunately, the production of original work is uncertain; impulse and temperament must be in tune with the task, and it is hard to conceive of an assigned study partaking much of inspiration; like occasional poetry, it is apt to be sterile. Yet, it may be argued that, whether important discoveries were forthcoming or not, the exhaustive consideration of the subject appearing in printed form, and made available to all, would furnish an excellent source of reference as to the latest ideas on the subject.

Assuming that such a plan would add something new and worth while, could the program be carried out by any of the existing societies? This seems scarcely possible without adding to the already sufficiently long programs, and it is unthinkable that any of these organizations would consider undergoing such a complete change of character as would be necessary to transform it into a research organization.

On the other hand, a two day program, either just before or just after the meeting of the American Medical Association, may be worthy of serious consideration. This would have the advantage of not requiring another journey on the part of those who desired to attend both the section on ophthalmology and the research society, and would avoid cutting down the attendance at the society meetings because of those who can attend only one or at most two meetings a year and must choose between the various organizations. The added two days of meeting should not prove too great a hardship. This plan would have the further advantage of excluding the possibility of the research organization always meeting in the same place, the outcome of which practice is usually that a primarily national organization becomes merely local.

A weighty criticism of the plan for a new society is that it would divert a certain number of contributions from the programs of the other societies. This is undoubtedly true, be-

cause some of the work presented before the research society would surely have been undertaken whether there was a research society or not; yet a large part of the material would be the product of the assigned investigation, which would never have been even thought of were the new society not in existence.

Many other details are to be considered, but all in all it seems that the idea may be worth a trial. The past forty years in ophthalmology have been prolific of minor contributions, but there have been few really great discoveries. Perhaps a society such as is now proposed would provide the avenue to such discoveries.

Now is the time for ophthalmologists to consider this question, so that they may be prepared to discuss it intelligently when again presented by the trustees.

Lawrence Post.

ULTRAVIOLET RADIATION IN OPHTHALMOLOGY

The active interest in this branch of ophthalmic therapeutics that has been shown in Great Britain was brought to the attention of our readers last year (volume 11, pages 656, 667, 830, and 1007). A still more active interest was shown by the symposium on the ultraviolet ray which was an important part of the work of the Oxford Congress for 1928. In this symposium ten speakers participated, and the discussion from various points of view brought out some practical suggestions.

Professor Leonard Hill indicated the wide range of electromagnetic radiations now known, among which the ultraviolet, coming next to light, are most important for their chemic, biologic, and therapeutic effects. Infrared rays have little power of penetration through moist tissues. By experiment a certain exposure raised the temperature beneath the skin to 43° C., but an equal exposure to visible and ultraviolet rays raised it to 47.5° C. Ultraviolet rays come, not only in direct sunlight, but with the

light from blue sky and white clouds. The sky light may be the more important source. Harm may be done by an excessive dose. The practical question is, what is the appropriate dose for the particular patient? The erythema produced appears to be the most practical guide to dosage. For lamp exposures the time of exposure and the proximity and nature of the lamp must be considered; and for sun and sky exposures the time of day and the altitude and latitude of the place.

This form of therapy has proved of special value in tuberculous infections, in which the balance of forces may be "tipped over to the side of recovery". In regard to general infective troubles the results are more doubtful. But in the various forms of tuberculous uveitis, the results vary from complete recovery to arrest of the process, leaving a quiet eye. Among thirty-five cases, Duke-Elder reported that the progress of the disease had been arrested in all but two, in one of which the patient had been unable to continue the treatment. Corneal ulcer responds most dramatically to local ultraviolet treatment, particularly marginal and chronic recurrent ulcers. Even for hypopyon ulcers this is the treatment of choice: adopted as a routine, it has largely obviated the need for operative treatment. Blepharitis, recurrent hordeolum, keratitis, and episcleritis are mentioned as favorably influenced by general phototherapy.

Edward Jackson.

PROBLEMS IN PRESBYOPIA

It has long been thought (see for example, Fuchs's "Textbook of Ophthalmology" seventh edition, page 179) that presbyopia is a condition which manifests itself about the age of forty-five years or even between forty-five and fifty. But it is a fact now too often observed to permit of any uncertainty, that the wear and tear of the strenuous lives which so many of us live, or some other equally common factor, causes many people to need assistance in the way of glasses for near work at a much earlier age.

For some years the writer has noticed, and has often commented upon, the large number of people under forty years who are unable to read, thread a needle, or do any of the ordinary things requiring clear close vision, without the aid of special glasses.

It is stated that the power of accommodation begins to diminish at a very early age, and, according to Duane's table, the deterioration is even quite apparent between the ages of ten and fifteen years, but these same tables indicate that the average power of accommodation is sufficient for the demands on one's eyes till well into the forties. Yet careful observation among those who do much near work suggests that the age of presbyopia, as measured by the age at which one needs assistance in the shape of special glasses for near work under the stress of modern conditions of living and working, has been changed from the forty-fifth to somewhere between the thirty-fifth and the fortieth year. An inquiry among colleagues has not shown that a great many have been struck by this experience, but by bringing the matter before a larger audience in this way it is hoped that the observation may either be corroborated or refuted.

Another curious phenomenon in relation to presbyopia has been noticed since the accumulation of records which cover many years of the lives of patients has made the comparison possible. Patients seen in early age, with a total hyperopia of say three diopters and a manifest hyperopia of two diopters, will wear the manifest correction for years with satisfaction. In due time the near point recedes, without all of the hyperopia becoming manifest, and the patient may still have one diopter of latent hyperopia but require one or two diopters added for reading. In some cases, of course, the hyperopia has actually lessened in the course of time, and the two diopters in the case mentioned may have come to represent the total hyperopia. But this does not occur in every such case, and it is interesting to specu-

late on just what has happened. If the accommodation has been lost, why is not all of the hyperopia manifest? If it has not been lost, why is a reading addition to the distant glasses required?

E. C. Ellett.

SPONTANEOUS CURE OF INCURABLE DISEASES

If in the thirtieth century the human race has not learned to control its frailties to an extent which will abolish disease, the superphysician of that era, making his professional visits in some undreamed-of type of airship from Washington to Peking or from north to south pole, may be so profoundly gifted in the understanding of disease that for each malign bodily influence he will have an individual and immediate cure.

But in the next few centuries after this still imperfect twentieth, if not as long as the human race exists, it is likely that there will be a number of "incurable" diseases. Of these there are now plenty. They overwhelm us or stimulate us with a feeling of our professional impotence.

Perhaps the greatest mystery about these mysterious "incurables" is the fact that at times they seem to recover spontaneously, quite commonly after the physician or a group of physicians have pronounced the death sentence upon the unfortunate patient or upon the particular part of his anatomy which is involved in the disease process.

Carl Hamburger of Berlin, gallant and brilliant propagandist of a series of medical theories and therapies, of which the latest are his antiglaucomatous preparations, glaucosan and amin-glaucosan, has recently devoted his optimistic imagination to a review of some "hopeless" diseases in which nature, apparently disregarding her own rules, but really disclosing new applications of them, has occasionally snatched the victim from his doom. (*Selbstheilung hoffnungsloser Krankheiten*, Jena, Verlag von Gustav Fischer, 1928.)

On the title page of his brochure Hamburger has inscribed the saying of François Arago that "whoever, outside of pure mathematics, utters the word 'impossible', acts imprudently". "A hundred years ago (1828) the most highly respected scientific body in the world called hopeless the design to render operations painless, and refused even to enter upon a test of narcosis". Each in its day, quinine (1638) and belladonna (150 years later) were accorded the same incredulous reception. "The Utopia of today", says Hamburger "is often enough the obvious of tomorrow". Several years ago Brugsch comforted his German compatriots with the declaration that insulin would have been discovered thirty-five years earlier, and in Germany, if Pflüger of Bonn had not blocked the path of investigation with his "supercriticism".

"The study of natural cures, full of secrets and revelations" said Marx, a Göttingen professor of the middle of the last century, "can not be recommended with enough emphasis."

Such thoughts, with his own experiences and observation, impel Hamburger to the deliberate statement that he has selected as his special field of investigation the therapeutic pursuit of this problem. Medicine, he remarks, is not a natural science but an empirical science. In his monograph he reviews critically but optimistically some of the miracles of spontaneous cure of the incurable, as related by men of note in the world of medicine. Mauthner and Kuhnt, among others, have recorded the cure of optic atrophy by small pox(!), and of severe ocular tuberculosis by erysipelas. Hamburger himself, with the patient's full knowledge and consent, resorted to the desperate but ancient procedure of inoculating old trachomatous eyes with gonorrhea, and had the satisfaction of seeing the patient, who had previously had to be led, walk alone and without a cane through the streets of Berlin. The same treatment had been used successfully by Goldzieher.

Ahlström saw sympathetic ophthalmia quickly and completely cured during a violent attack of malaria; Dimmer a somewhat similar result after an acute febrile attack of tonsillitis; and another writer a rapid recovery from sympathetic ophthalmia during an unquestionable scarlatina with high temperature.

Hamburger goes on to recite a few of the well authenticated cases of spontaneous cure of senile cataract. While most of these recoveries involve liquefaction and absorption of the cortex and nucleus, Hess and others have vouched for definite cases of clearing of advanced opacity, without resorption of the lens. These cataracts were chiefly of the "complicated" type, and resorption occurred (according to Hess) "in relation to acute inflammations with disturbances of nutrition".

Hamburger is inclined to believe that reduction of tension in the treatment of glaucoma is obtained by causing an inflammatory process. He has succeeded in lowering the tension of glaucomatous eyes by cauterizing the periphery of the cornea with lunar caustic. The problem, he says, is to discover a means of producing inflammation which shall be controllable and measurable.

If one disease is to destroy another, it is of the utmost importance to learn which diseases tend to exclude one another. Wolff, Rokitansky, and Bayle have argued that cancer and tuberculosis were incompatible; others that tuberculosis and mitral regurgitation were antagonistic to one another. Bier saw a case in which severe asthma was completely quiescent for six months after an intercostal herpes zoster. Axenfeld recommends that choroidal detachment after operation for glaucoma shall not be treated, because so long as it persists the eye remains soft. Turnowski has described several cases of severe epilepsy which were improved or cured after scarlatina or pneumonia; Blatt a case of retinal detachment with reattachment after a severe attack of typhus.

Hamburger's therapeutic conceptions are bold and radical, but they may contain important germs of truth. In the last few years much has been accomplished in the application of light therapy. But it has been laid down as a cardinal fact that the action of light is primarily abiotic. What tends to destroy may, by reaction, awaken the regenerative powers of living cells. The use of milk injections, of typhoid vaccine, of diphtheria antitoxin, and of the ancient seton are additional physical examples of the same principle. In the general field of human progress, it has been argued that the wonderful inventiveness of the American people arose primarily from the bitter struggle between early New England settlers and the harsh natural conditions with which they were surrounded during many months of each year.

W. H. Crisp.

BOOK NOTICES

Ophthalmological Society of the United Kingdom, Transactions for 1928. Cloth, octavo, 568 pages, 5 plates (2 in colors), 64 illustrations in text. London, J. and A. Churchill, 1928.

In this volume, presenting a record of work done in 1928, we find evidence that the Ophthalmological Society of the United Kingdom and its affiliated societies have quite recovered from the strain and limitations of the war period. The high character of its formal addresses and longer papers, the practical character of its clinical papers and brief case reports, the excellence of its illustrations, particularly its colored plates, showing a cyst of the iris, a warty condition of conjunctiva following x-ray exposures, and the fundus oculi of a cat showing normal circulation and fragmentation of blood stream, all give evidence that the scientific, practical, literary, and artistic standards of this series of transactions are now fully sustained.

The address of the president, C. H. Usher, on "Some relationships be-

tween animals' eyes and human ophthalmology"; the Bowman Lecture by G. Elliot Smith on "The new vision", pointing out the reorganization of the human brain, as compared with that of the nearer animals, produced by the elaboration and higher refinement of visual function; "The natural history of retinal neoplasms", by E. Treacher Collins; the tabular report of one hundred consecutive refraction cases by A. F. MacCallan; the symposium on inflammatory affections of the orbit, and one on the ultraviolet ray", before the Oxford Congress; the Doyne Memorial lecture on the pecten, by Arthur Thomson; and the paper on sympathetic ophthalmitis, by T. Harrison Butler and E. W. Assinder, are such as all ophthalmologists should wish to have at hand for reference; and the reading of such papers will give more of suggestion and inspiration and keep the reader more thoroughly abreast of the time than could the same expenditure of energy and thought in any other direction."

When it is understood that the above are selected from more than one hundred titles contained in this volume, it will be understood how great a part the transactions play in the current literature of ophthalmology. Perhaps the first reader of this notice will think "Coats's disease, juvenile form" by M. S. Mayou, "Atypical cases of retinitis pigmentosa" by Montague Hine, and "Melanomata and malignant tumors of the choroid" by A. W. Mulock Houwer equally worthy of attention. To know the current literature of ophthalmology is a great undertaking, but it brings so much of interest that he who attempts it always finds it worth while.

Edward Jackson.

Funktionelle Veränderungen am Gefäßsystem der Netzhaut. (Functional changes in the vascular system of the retina), by K. Mylius. 82 pages, illustrated. 1928, S. Karger, Berlin. Paper, 800 marks.

Functional vascular changes, in the form of narrowing of the lumen of the retinal vessels, are the visible expression and sequels of abnormal conditions of the vascular muscles and occur either as spastic-tetanic or as tonic contractions. The author emphasizes the necessity for clear definitions. "Spasm" involves the conception of transitory change, as there is no constant spasm of smooth muscular fibers. It means muscular contraction during which mechanical work, heat, and electricity are generated, demanding a steady afflux of energy and stimulation. Very strong, or summation of weak, stimulations may elicit a tetanic condition of greater or less duration, with subsequent signs of exhaustion that appear as fluctuations of contraction and finally must lead to relaxation and return to a physiological basis. These conditions may occur on circumscribed or longer sections of the retinal vessels.

Constancy of contraction of smooth muscular fibers without constant intrinsic work and consequently without symptoms of exhaustion is classed under variations of tonus, manifested by anemia and hyperemia. Functional vascular changes may frequently be the starting point of organic disorders. They are, according to the latest researches, widely subject to the influence of the nervous system. The vasculomotor centers determining vascular tonus are cerebral, spinal in the medulla oblongata and in the segments of the spinal cord, and peripheral as histologically proved between adventitia and muscularis, which, although normally interdependent, may become automatic under pathological conditions. Further discussion includes the anatomical peculiarities of the retinal vascular system, with results of the author's own investigations in some doubtful points; vascular changes in eclampsia, illustrated by eight detailed clinical histories; in polycythemia, with case histories; in migraine, Raynaud's disease, lead poisoning and other diseases; and finally hypertony of the

retinal vessels, with thirty-five photographs of the fundus. This valuable monograph will be read with great interest and benefit.

C. Zimmermann.

What everyone should know about eyes. By F. Park Lewis. The National Health Series, edited by the National Health Council. 70 pages. 18mo flexible fabrikoid, price thirty cents. 1928. Funk and Wagnalls Company, New York and London.

The National Health Council, of which the National Society for the Prevention of Blindness is an active member, has undertaken the publication of a "National Health Series" the object of which is to provide the general public with authoritative books on health at low cost.

Dr. F. Park Lewis, vice-president of the National Society for the Prevention of Blindness, has evidently undertaken this little work on the eye as a labor of love, and he displays in it all his characteristic ability to write charmingly on medical topics for the layman. The first part deals with the mechanism of sight, the second with "when the mechanism gets out of order," the third with the eye in middle life and beyond, and the fourth with eye inheritances.

It seems usually impossible for the technical writer to place himself completely on the level of his lay audience in the use of words and forms of explanation, but Dr. Lewis' qualifications in this respect are almost ideal, and only occasionally does he allow himself to employ a word with regard to whose meaning most educated laymen would feel uncertainty. Quite naturally, in a work of this kind it is necessary to state dogmatically some matters of disputed theory; for example with regard to the cause of myopia or strabismus.

A useful statement is included as to the mode of testing visual acuity, and the "play" method of investigating visual acuity before the reading age,

recently popularized by the National Society for the Prevention of Blindness, is illustrated with a number of photographs. These and two facsimiles of Snellen's test cards are unfortunately the only illustrations; although a layman would surely derive much more substantial advantage from the explanations of anatomy and physiology if these were accompanied by at least a few diagrams. It would probably have avoided occasional misunderstanding if mention had been made of the fact that the test type had been reduced for reproduction in this book. In a subsequent edition correction should be made of an error on page seven, where it is stated that many of those who have better than nominally normal vision are able to read the "20-foot line at 15 feet".

The pocket size, excellent printing, and flexible covers of these little volumes make them very attractive for popular reading. *W. H. Crisp.*

Your eyes and their care. By Edgar S. Thomson. Octavo, 175 pages. Cloth bound, \$1.50. D. Appleton and Company, New York and London, 1929.

The general purpose of this book is similar to that of Lewis' smaller volume, mentioned above. It is more ambitious in form, and much larger, although on account of differences in printing it actually contains only about twice as much text as the smaller volume. Its mode of statement is on the whole simple and direct, although at times perhaps a trifle too formal. It gives one the impres-

sion of being rather in the nature of a textbook on the eye for the layman than an attempt to charm and interest him in the subject. It has the advantage of containing a few anatomical drawings and some diagrams to illustrate the processes of refraction.

As stated in the preface, practical problems have been stressed, and the question which the author has kept before him is "What information will be of advantage to the individual to enable him to cooperate understandingly in case of need?" The volume might very well serve as a textbook for nurses, except that it has not a sufficient abundance of illustrations. It is divided into the following chapters: 1, anatomy and physiology; 2, the developmental period; 3, adult life; 4, advanced age; 5, injuries.

The book, which is one of a seemingly excellent series from the same publisher on a great variety of health subjects, should serve a very useful purpose among those who take the pains to acquire information concerning the bodies and senses of themselves or of their families, or it may be of those who are institutionally or industrially under their care.

W. H. Crisp.

Selbstheilung hoffnungsloser Krankheiten (Spontaneous cure of hopeless diseases). Dr. Carl Hamburger, Berlin. 41 pages with 4 curves in the text. Paper covers, price 2.50 marks. Jena, Verlag von Gustav Fischer. 1928.

(See editorial, page 319 of this issue.)

ABSTRACT DEPARTMENT

Abstracts are classified under the divisions listed below, which broadly correspond to those formerly used in the Ophthalmic Year Book. It must be remembered that any given paper may belong to several divisions of ophthalmology, although here it is only mentioned in one. Not all of the headings will necessarily be found in any one issue of the Journal.

CLASSIFICATION

- | | |
|--|---|
| 1. General methods of diagnosis | 9. Crystalline lens |
| 2. Therapeutics and operations | 10. Retina and vitreous |
| 3. Physiologic optics, refraction, and color vision | 11. Optic nerve and toxic amblyopias |
| 4. Ocular movements | 12. Visual tracts and centers |
| 5. Conjunctiva | 13. Eyeball and orbit |
| 6. Cornea and sclera | 14. Eyelids and lacrimal apparatus |
| 7. Uveal tract, sympathetic disease, and aqueous humor | 15. Tumors |
| 8. Glaucoma and ocular tension | 16. Injuries |
| | 17. Systemic diseases, including parasites |
| | 18. Hygiene, sociology, education and history |

1. GENERAL METHODS OF DIAGNOSIS

Dieter, W. **The localizing diagnostic significance of anisocoria with homogeneous hemianopia.** *Zeit. f. Augenh.*, 1928, v. 66, Nov., p. 300.

Behr states that in homogeneous hemianopia the pupil on the blind side (i.e. the side opposite the lesion) is larger. This has been corroborated experimentally by Schlessinger and Best. In homogeneous intracerebral hemianopia anisocoria is absent, or if it is present the larger pupil is on the same side as the lesion. To emphasize the localizing diagnostic importance of this phenomenon, the author reports in detail a case in which softening in the occipital cortex caused temporary homogeneous hemianopia with transient hemianopic pupilloplegia. Anisocoria was absent throughout the course of the disease. The author has prepared a table which presents the necessary diagnostic data in useful form.

F. H. Haessler.

Weihmann, Max. **Photography of the eye in natural size.** *Klin. M. f. Augenh.*, 1928, v. 81, Oct., pp. 473-475. (4 ill.)

Weihmann describes his method

with adaptation of the stand of the Zeiss binocular corneal microscope.

C. Zimmermann.

2. THERAPEUTICS AND OPERATIONS

Derby, G. S., and Carvill, M. **Anterior ocular tuberculosis.** *Trans. Amer. Ophth. Soc.*, 1927, v. 25, p. 104.

Derby and Carvill, with T. Eastman as internist, established a special class in 1909 at the Massachusetts Eye and Ear infirmary for the treatment of anterior ocular tuberculosis. From this group 130 patients with anterior ocular tuberculosis were selected for study. Phlyctenular keratitis was the initial inflammation in over half of the cases; among the others were episcleritis, scleritis, sclerokeratitis, uveitis, and iritis.

The study was conducted upon several lines, including age at onset (grouped by type of ocular disease of first attack), diagnosis, race, sex, other signs of tuberculosis, tuberculosis in family, severity, vision of both eyes in 1926, complications, interstitial keratitis, recurrence, long periods of quiescence, mortality, and use of tuberculin. Uncomplicated iritis and uveitis, and retinal and choroidal cases, were not taken.

The authors believe that phlyctenular disease, nodular scleritis, sclerokeratitis, and sclerosing keratitis rest on a basis of tuberculosis.

The majority of the cases showed chronicity and tendency to recurrence.

A bouillon filtrate was freely used. O.T. was also employed. The initial dose in a majority of cases was 1/100,000 mg., increased as regularly as possible every five to seven days. In a few instances tuberculosis has seemed to be of direct benefit to the patient. In two cases tuberculin did great harm; both patients lost the sight of both eyes. In the great majority of cases tuberculin did neither harm nor good. The most that can be said of tuberculin therapy is that in certain instances it may help in cutting short the present attack. It does not prevent recurrences.

We have held anterior ocular tuberculosis too lightly. We ought to regard it as in the same class as the arrested case of pulmonary tuberculosis. Unless the resistance is kept high these cases are liable to a succession of recurrences. In addition, they are peculiarly prone to develop serious tuberculosis elsewhere.

John A. McCaw.

Duke-Elder, W. S. and P. M. **A histological study on the action of short-waved light upon the eye, with a note on "inclusion bodies".** Brit. Jour. Ophth., 1929, v. 13, Jan., p. 1.

This contribution is a continuation of a series of observations which these investigators have published from time to time in the same journal. The clinical and histological appearances associated with the abiotic reaction to light, as seen in experimentally radiated animals, are described in the cornea, the conjunctiva, the iris, the lens, and the retina. The changes in all these tissues are the same in kind although varying in degree. The most interesting and characteristic of these changes is an oxyphile degeneration affecting particularly the nuclear chromatin, which may progress to the formation of

acidophile granules or of granular or homogeneous nuclear inclusions. Originally intranuclear, these may be extruded into the cytoplasm with disintegration of the nuclei, a process which may culminate in death and disintegration of the cell. The reaction is characterized by an intense vascular engorgement, in places where that is possible, and is followed by rapid regeneration and resolution in which the absence of karyokinetic activity is notable.

The nature of the general abiotic reaction of living tissue is discussed, and it is pointed out that its basis is a photochemical denaturation affecting the proteins of the cells. With regard to the cornea, the therapeutic effect of ultraviolet light in inflammatory, degenerative, and ulcerative conditions is discussed. With regard to the lens, two separate effects are demonstrated; the first, markedly evident histologically, affecting the capsule and the subcapsular epithelium, the second, less histologically evident, affecting the lens substance. The significance of both of these in the pathogenesis of cataract is dealt with. It is concluded that, in common with other regions of the energy spectrum, ultraviolet radiations cannot be exonerated from a share in the etiology of this condition. The subcapsular epithelial "wall" is described, but, although several relevant influences are dealt with, no satisfactory explanation of its occurrence seems forthcoming: a similar appearance is seen in the corneal epithelium.

Definite abiotic changes are described in the retina as affecting mainly the ganglion cells and the inner nuclear layer. These consist essentially of chromatolysis and an acidophile tendency. The significance of these changes is discussed, and the conclusion is suggested that they are rather of the nature of a pathological intensification of physiological processes of vision than a direct abiotic response, although the occurrence of the latter in a specially sensitized

tissue is not altogether impossible. An analogy is suggested between the nuclear appearances of abiotically traumatized tissue and the inclusion bodies described as occurring in the lesions caused by herpetic and other viruses, and possibly also in trachoma. The analogy tends to support the opinion that these appearances are degenerative in nature and nonspecific in origin. (Exhaustive bibliography.)

D. F. Harbridge.

Marx, E., Mendes da Costa-Vet, É., Naar, C., and Wolff, L. K. **New substitutes for cocaine in ophthalmology.** *Klin. M. f. Augenh.*, 1928, v. 81, Oct., pp. 433-456. (13 ill., 2 tables.)

The authors tested cocaine and its new substitutes, holocaine, novocaine, eucaine, tutocaine, psicaine, butyn, etc., as to their anesthetic effects on the cornea, pain, influence on the conjunctival vessels, on the pupils, ocular tension, cornea, general toxicity and reliability in regard to preservation and sterilization, with these results: Up to date none of the new anesthetics is able to supplant cocaine in ophthalmology. Most of them are more painful, and all cause dilatation of the blood vessels.

C. Zimmermann.

Wilmer, W. H. **Diseases of the eye in old age.** *Arch. of Ophth.*, 1929, v. 1, Jan., pp. 42-62.

The first half of this paper discusses the various changes of the eye in old age, and the diseases to which it is then subject. These changes and diseases include involutional changes in the eyelids; pinguecula; flattening of the cornea; arcus senilis; iris changes; tessellation of the retina; colloidal changes in the choroid; changes in structure and refraction of the crystalline lens; presbyopia; cataract; and glaucoma.

The second half of the paper deals with therapeutic measures used for the relief of these conditions. Presbyopia and its proper alleviation are discussed in some detail. Speaking of cataract, the following measures are

suggested for the comfort of the patient, and the possible arrest of the condition; first, the search for focal infection; second, a diet carefully balanced, with plenty of water between meals; third, treatment of any concomitant ocular lesion; fourth, dionin and hot applications followed by cold, as helps in the nutrition of the lens; fifth, mild mydriatics, such as five per cent solution of ephedrine, for use every morning to maintain moderate dilatation of the pupil in cases of central lens change; sixth, covering all portions of reading matter not immediately under observation, to cut out the glare from the balance of the page; seventh, extraction of the cataract, either in the capsule or by the capsulotomy method; eighth, recommendations for the best lighting possible. The care of acute and chronic glaucoma is discussed.

M. H. Post.

3. PHYSIOLOGIC OPTICS, REFRACTION, AND COLOR VISION

Beach, S. J. **Total congenital color-blindness.** *Jour. Amer. Med. Assoc.*, 1928, Sept. 29, p. 934.

It is a surprise to learn from this article that, in an extensive bibliography by Bell submitted two years ago, only one report out of 119 cases recorded on this topic came from this continent. Beach feels that the name total color-blindness in no way indicates the true nature of this condition.

Three cases are reported. The author's summary follows:

Total color blindness is characterized by complete absence of color perception, light blindness, and impaired central vision, often accompanied by nystagmus. The luminosity curve shows the brilliant part of the spectrum in the green, with shortening at the red end. It is obviously more than merely an extreme or composite manifestation of the usual types of color blindness. Since the same phenomena appear during normal dark vision, this anomaly seems like a condition of permanent dark adaptation. It differs from the nor-

mal in having no threshold either for colors or for central vision, and entirely lacks the power of light adaptation. The duplicity theory explains this anomaly as abeyance of the function of the cones. Hence physicists designate it as "rod vision". While nothing can be done to change the underlying abnormalities, these patients gain in comfort and efficiency from shaded lenses carrying their correction. *D. H. O'Rourke.*

Birnbaum, H. **Does myopia due to study really exist?** *Arch. d'Opht.*, 1929, v. 46, Jan., p. 38.

The tendency, as the age increases, toward diminution of the hypermetropia usually present in the new born is emphasized. It seems natural that those born with a low degree of hyperopia might develop myopia as the hyperopia diminishes. This reduction in hyperopia or change toward myopia occurs in children of preschool age. Thus it does not necessarily follow that school work causes myopia. Two factors determining the refraction of the eye are the corneal curvature and the length of the eyeball. It is possible that these factors may be transmitted by heredity with intermediary stages, as is color in negroes. Myopia is more prevalent amongst the more intellectual persons who do near work than amongst those of lower classes who do near work. The survival of the fittest may have helped to eliminate the myopes in savage races and to preserve them in the civilized races.

M. F. Weymann.

Cucchia, A. **Perimacular vision in physiologic conditions.** *Ann. di Ottal.*, 1928, v. 56, March, pp. 256-262.

The aim of the author was to determine the visual acuity in different sections of the retinal zone extending ten degrees around the fovea centralis, in healthy and emmetropic eyes. He used a cardboard 2 by 2.5 meters, with two black lines intersecting at right angles to each other. The inner part of the four arms so obtained was divided into five sections. The limit

of the first section was marked at 0.1745 m. from the intersection of the two lines, the second at 0.3495 m., the third at 0.5255 m., fourth at 0.7025 m., and the last section at 0.8815 m. The author found that these distances corresponded respectively to the angular distances of 2°, 4°, 6°, 8°, and 10° of the retinal zone around the fovea, if the person to be examined looked at these points while sitting five m. from the center of the cardboard. At the intersection of the two lines the dioptrimeter devised by Contino was placed. The front round aperture of this apparatus shows a V figure, which by a special device can be made larger or smaller; the resulting sizes correspond to the different sizes of the Snellen's test types. The patient is directed to look with each eye separately at the different marks of the cardboard lines while the size of the V is changed. The size which is visible at each mark indicates the fraction of the visual acuity of the corresponding degree of the retinal zone.

The author found that the visual acuity was best on the temporal side, the nasal coming next, then the superior, and last the internal. The values obtained show a slight difference in the two eyes, but this difference does not alter the relation of the visual acuity in the various sectors of the corresponding arms. Indirect vision does not decrease progressively according to a constant law. At 2° from the fovea the vision is 6/10 of normal, at 4° it is 4/10, at 6° it is 3/10, at 8° it is 2/10, and at 10° it is 1/10. Indirect vision starts at the limit of the macular zone.

Bozzoli, in his researches on the extent of direct vision and the size of the macula, observed that distinct vision corresponded to an angular distance of 2.45° from the center of the fovea, and that this distance corresponded to a little less than the anatomic macular zone. The present author found that at two degrees from the fovea, that is at the limit of an area subtending an angle of 4° from

the center of the fovea, the visual acuity was markedly decreased. This area corresponds approximately to the anatomic macular zone. (Bibliography.)

M. Lombardo.

Dufour, M. **On the color theory of W. Ostwald.** Bull. Soc. Franç. d'Ophth., 1928, p. 104.

Dufour explains and criticizes favorably the color theory of W. Ostwald, whose color atlas and chromatic circle are recommended to those working in physiologic optics and particularly to those interested in color blindness.

Phillips Thygeson.

Ferrer, Horacio. **Successful operation in a person twenty-nine years old, blind from birth.** Published by author.

Ferrer describes at some length the results of cataract extraction in a man twenty-nine years of age, blind from birth. Binocular vision developed, and the intense nystagmus disappeared six weeks after the first operation. Central vision developed first, followed by peripheral vision. At the time of writing, visual acuity was 1/10, and was improving. It is concluded that the remarkable "sense of obstacles" is not a special sense, but is due to increased acuity of touch, smell, and hearing. The detailed description of the patient's experiences in the acquisition of vision does not lend itself to abstraction.

George H. Stine.

Gertz, Hans. **The law of images formed in the optical system.** Acta Ophth., 1928, v. 6, no. 3, pp. 216-221.

Gertz points out that one may develop the theory of the optical system in two different ways. The ordinary procedure, founded upon laws of refraction, consists in the deduction of the fundamental relations for a single optical surface. The second, the purely geometric method, admits colinear dependence between spaces and permits a greater precision. The optical images are infinitely small and are

formed of bundles of elementary rays, and for this reason the geometric method of study is preferable. The writer goes on to develop various laws through long formulæ which must be read in their entirety.

E. M. Blake.

Gjessing, H. G. A. **Comparative refraction determinations.** Acta Ophth., 1928, v. 6, no. 3, pp. 222-237.

Gjessing studied the results in 780 eyes of 460 patients whose refraction was determined by four different methods, the trial case and the Thorner-Busch refractometer, skiascopy, and Holth's kinescopy. He concludes that in actual practice the four methods give almost uniform results, and in most cases not more than 0.5 diopter difference was found. Skiascopy is the most rapid method. Kinescopy gives almost identical results with Snellen's method, and can be used with opacities of the media and patients with lowered intelligence. The refractometer gives satisfactory results where there is no astigmatism. (See also editorial page 227)

E. M. Blake.

Hedinger, Mary. **Mariotte's spot in axial myopia.** Graefes Arch., 1928, v. 121, p. 126.

The author mapped the blind spot on a Bjerrum chart at two meters distance in one hundred myopic eyes of seventy-six patients, first without correction and then after putting on concave lenses. The blind spot in the uncorrected myopic eye is brought somewhat nearer to the fixation point than in the emmetropic eye. The correcting concave lens moves the blind spot temporalwards, acting like a prism. The blind spot of the corrected eye in almost two-thirds of the cases is greater than that of the uncorrected eye, principally because the correcting lens limits the circle of dispersion. In sixty-one eyes with only a scleral crescent and without choroidal changes the blind spot was no greater or hardly greater than in emmetropic eyes. Circumpapillary

choroidal atrophy has always produced a definite increase of the blind spot. The latter, however, is not dependent upon the size of the area of choroidal atrophy, but depends principally on whether the atrophy is in an advanced or in a beginning stage.

H. D. Lamb.

Heinonen, Oskar. **Factors in the development of myopia.** *Acta Ophth.*, 1928, v. 6, no. 3, pp. 238-250.

Heinonen demonstrates that myopia increases in percentage and amount with the successively higher grades of school life. He is satisfied, however, that the close work of school life is not alone the most important factor in the development of short-sightedness, but that there is a deeper, endogenous cause. Myopia is more frequent in intellectual workers than in manual laborers, and the children of the former are more likely to become myopic. Thus the percentage of myopia in the children of school teachers reached twenty-two per cent, while the general average was six to seven per cent. Myopia is correlatively bound with a positive selective value to the intellectual endowment of the individual. The article concludes with the statement that "we have here, perhaps, one of the apparently many causes for so-called school and occupational myopia".

E. M. Blake.

Levinsohn. **Newer ways of combating myopia.** *Arch. f. Augenh.*, 1928, v. 99, Nov., p. 569.

In discussing the prevention of myopia, Levinsohn emphasizes the importance of the child being in an erect position in school while reading, writing, and studying. The article contains illustrations of the type of school bench that will prevent slouching down in the chair, which he feels is most important. Improving the general physical condition by properly regulated gymnasium work and athletics also has a decided place in preventing the progression of myopia.

Frederick C. Cordes.

Polliot. **The theory of Bard's "local index".** *Arch. d'Opht.*, 1929, v. 46, Jan., p. 46.

Exception is taken to Bard's theory that the cones themselves have the faculty of projecting images into space according to the direction of their axes and of discerning depth by the reception of a three dimensional image upon themselves (see abstract of Bard's article in January, 1928). Bard explained absence of perception of the blind spot by the fact that the cones surrounding it had their axes directed toward its center and thus the image found here was projected over the blind area. By experimentation the writer was unable to demonstrate that this was true, as the line delimiting the scotoma appeared fairly sharp on its border. He also mentions the convergence of the axes of the cones in the fovea as evidence against Bard's theory. We do not notice the blind spot because of the constant slight motion of the eye, and depth perception is a complex phenomenon dependent upon convergence, parallax, and head-movements. There is a reply by Bard to these criticisms, and a rebuttal by Polliot.

M. F. Weymann.

Post, L. T. **Headaches of ocular origin.** *Jour. Missouri State Med. Assoc.*, 1928, v. 25, Nov., p. 503.

Post analyzed about three hundred cases of headache as to cause, frequency, nature, location, and response to treatment, and found it the chief complaint in sixty-two per cent. He concludes that there are no certain features of nature or location of headache which indicate absolutely ocular origin, or determine the kind of error of refraction or muscle imbalance. However, a history of bilateral frontal headache associated with or aggravated by use of the eyes, and only rarely occurring on arising, is very suggestive in the differential diagnosis between headaches due to eye-strain and other headaches. The percentages are interesting and should be read in the original. (Discussion.)

George H. Stine.

Reeder, James C. **Inversion of the color fields in cardiospasm.** Jour. Iowa State Med. Soc., 1928, v. 18, Dec., p. 470.

Reeder reports seventeen cases of cardiospasm all of which showed (1) more or less inversion of the color fields, and (2) psychoneurotic tendencies. He believes that the change in fields is a valuable differential sign in lesions of the esophagus.

Ralph W. Danielson.

Saba, V. **The sclerotrabecular insertion of Brücke's muscle in the human eye.** Ann. di Ottal., 1928, v. 56, June, pp. 519-524.

(This abstract partly duplicates one published in the January issue (p. 61), but is published because in the January issue the essay was incorrectly attributed to the Archivio di Ottalmologia.)

Examining at the microscope slides of human eyes taken from the rich collection of Professor Maggiore of the eye department of Sassari University medical college, the author could distinguish three different types of insertion of the ciliary muscle. In type 1 the insertion takes place by three groups of longitudinal fibers. The first or internal group originates directly from the sclerocorneal trabeculæ, which close the canal posteriorly. The second or median group originate from the scleral spur, a scleral formation which limits the canal externally. The third group originates from the internal surface of the sclera. In type 2 all the longitudinal fibers originate from the scleral spur. In type 3 almost all the fibers originate from the trabecular part of the canal.

The author calls attention to two hypotheses derived from the anatomical disposition of these fibers. (1) The contraction of the ciliary muscle and its effect on the trabecular tissue may facilitate the excretion of the aqueous humor through the trabecular tissue into Schlemm's canal. (2) The varying type of insertion, peripheral (type 2) or anterior (type 3), may

have some influence on the act of accommodation. Three figures in the text explain the three different types of insertion of the muscle. (Bibliography.) *Melchior Lombardo.*

Sachs, Erich. **Contribution to the heredity of disturbances of color sense.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 231-233.

Sachs observed three deuteranopic sisters of a family which could be traced through several generations. The hereditary transmission confirmed anew the conclusion of Schiøtz that the inheritance of red-green blindness is always recessively sex-bound. The genealogical tree is given and discussed. *C. Zimmermann.*

Sarnelli, Tommaso. **On a phenomenon observable in vision in extreme proximity.** Arch. di Ottal., 1927, v. 34, Dec., pp. 572-575.

The author describes the following experiment: If in a dark room we bring before the corneal center of one of our eyes at a distance of from three to one millimeters a reflecting smooth steel ball fifteen mm. in diameter, which is illuminated by an ordinary electric lamp situated about seventy to eighty cm. lateral to the eye, and in front of the lamp we place an opaque cardboard through which a cross four cm. long and four cm. wide has been cut, we shall then project into the eye a conical bundle of rays of light reflected from the small brilliant image of the cross which will be formed on the surface of the steel ball. These rays will then give rise to a large circle of diffusion upon the retina. Inside this circle and beyond the endoptic spectrum of the lens, we shall note luminous specks in a half-darkened background, among which we shall recognize, sometimes only after patient search and even after having found it necessary to replace the ball with another of equal or approximately equal diameter, minute luminous crosses; which, if we revolve the steel ball on its vertical axis between the

tips of the fingers, will pass before our eye in the direction opposite to the motion of the little sphere.

Sarnelli's interpretation of the above phenomenon is as follows: The surface of a steel ball is only apparently smooth, being made up of numerous reflecting facets, too small to be seen by the naked eye, accidentally produced and each reflecting the image. The surface of the sphere is only apparently smooth, as can be confirmed under the low power of the microscope.

A. A. de Yoanna.

Scullica, F. **Macular vision in normal and pathologic conditions.** *Ann. di Ottal.*, 1928, v. 56, Sept., pp. 779-798.

The author recorded the field of vision in which objects of various size could be recognized. While individual differences were noted, in general his findings agreed with those of previous observers in that the fields were horizontally oval, and slightly larger to the temporal side. The vision corresponding to the outer limits of the macula was one-twentieth, reckoning the macular diameter as six millimeters. Previous methods of recording such fields are reviewed and records are given of a few pathological cases examined. (Bibliography.)

S. R. Gifford.

Sourasky, A. **The growth of the eye and the development of myopia; a study in the changes of refraction during the school period.** *Brit. Jour. Ophth.*, 1928, v. 12, Dec., p. 625.

This is a critical analysis of the follow-up study of the records of selected material obtained in 621 cases (1,242 eyes) of school children between the ages of five and eight and occasionally ten years. Sixty-five per cent of hypermetropes showed no reduction of their hypermetropia. Of the remainder only a few showed more than one diopter reduction, but in those that showed such a reduction, the tendency to reduction was pronounced. About thirty-five per cent of cases of myopia appeared to

be stationary, and eighteen per cent increased not over one diopter, so that in more than fifty per cent there was not the progression which one associates with myopia. The author asks the question: Do these cases of hyperopia passing over to myopia represent normal growth, i.e. is the myopia the physiological result of congenital absence of a high hyperopic reserve? It is concluded that there may be a varying rate at which the eyes of different individuals develop, but also that the two eyes in the same individual may develop at a different rate, and incidentally the congenital nature of most cases of anisometropia is questioned. Some cases of hypermetropia change as rapidly as myopia usually does. Some cases of myopia remain as stationary as hyperopia commonly does, and symmetrical eyes progress unequally.

D. F. Harbridge.

Tagawa, S. **Dispersions of the refracting media of the eye.** *Arch. f. Augenh.*, 1928, v. 99, Nov., p. 587.

Tagawa has done a careful study of the dispersions of the refractive media of the eye. While all media have a normal refractive value, this gradually increases with the decrease of wave-length. In the corneal epithelium, the increase of refractive value with decrease of wave-length is more marked than in other media of the eye. The corneal reflex increases strongly with decrease of the wave-length. The anterior and posterior pole and the equators of the lens have different refractive values but approximately equal dispersions. The dispersion of the nucleus increases more rapidly in light of short wave-length than does that of the remainder of the lens.

Frederick C. Cordes.

Tessier, G. **Physiologic excavation of the papilla in relation to static refraction.** *Ann. di Ottal.*, 1928, v. 56, June, pp. 525-534.

(This abstract partly duplicates one published in the January issue (p. 68), but is published because in the Jan-

uary issue the essay was incorrectly attributed to the Archivio di Ottalmologia.)

The author examined 1,250 persons, children included, 600 of whom had isometropic eyes. Emmetropic, hypermetropic, and myopic eyes were included in equal proportion. Three hundred were affected by spheric anisometropia, and 250 by astigmatic anisometropia. Excavation was found to be present almost in the same proportion in all the different refractive states, emmetropia and ametropias, and in some of these cases it was unilateral. The author remarks that physiologic excavation is a congenital formation and that its width and depth are not influenced by the static refraction of the eyes. The different and peculiar course of the blood vessels in a physiologic excavation may be an independent feature, or an effect and not the cause of the excavation. These principles are confirmed by study of comparative anatomy, which demonstrates that elsewhere in the animal kingdom nature creates no relation or dependency between the refractive state, the excavation, and the course of the retinal blood vessels. Physiologic excavation is deep in some animals and fishes, small or absent in others, while the eyes of different classes and species of animals show all kinds and degrees of ametropia. The conception that emmetropia represents a normal state of the eyes has not an absolute value from our knowledge of comparative anatomy. The human eye is considered normal if its dioptic system is adapted for great distances, and defective if affected by myopia or hyperopia. In the animal kingdom ametropia does not represent an "anomaly", for eyes of each animal species, in spite of their ametropias, are normally adapted for special conditions of living.

Melchior Lombardo.

4. OCULAR MOVEMENTS

Argañaraz, Raul. **Functional strabismus of infancy due to possible in-**

fection with a filterable virus. Arch. de Oft. de Buenos Aires. 1928, v. 3, Oct., p. 617.

Modern studies upon the organism of herpes and ultramicroscopic filterable viruses suggest that a strabismus which appears in an infant from time to time is due to a spasm of convergence arising from an irritation of the nuclei which control this function. The type of convergence strabismus which it is suggested may be due to this infection arises abruptly, and is frequently an aftermath of measles, whooping cough, chicken-pox, and so on.

A. G. Wilde.

Calhoun, F. P. **Chronic progressive ophthalmoplegia externa: case report.** Southern Med. Jour., 1927, v. 20, Dec., p. 923.

One case is reported in full detail, in which a toxic thyroid and severe dysentery may have been etiological factors.

George H. Stine.

Charamis, Jean S. **Oculomotor nerve in fractures of the base of the skull.** Arch. d'Ophth., 1928, v. 45, Dec., p. 759.

A detailed description of the anatomy of the third nerve is given with special attention to the arachnoidal portion. The close relation of this portion of the nerve with the posterior clinoid processes explains the ease with which, in fractures of the base, hematoma compresses the nerve at this point. A basal fracture with bilateral mydriasis in the absence of other signs of increased intracranial pressure does not offer a fatal prognosis, as it may be due to localized hematoma in this region.

M. F. Weymann.

Coulter, R. J. **The light sense in miners' nystagmus.** Brit. Med. Jour., 1928, Nov., 24, p. 929.

Coulter investigated one hundred cases of miners' nystagmus in regard to the light sense. Mr. Percival had previously reported in 1928 that in cases of miners' nystagmus he had invariably found the light minimum

greatly increased, while their light difference was very little if at all greater than his own. Coulter's cases were exactly the reverse of Percival's as they showed a reduction in both the light minimum and the light difference in about fifty per cent of the cases. It was learned, however, that Percival's observations had been made on fresh cases, while Coulter's were made on old ones.

The essayist makes the suggestion that the examination of the light sense will not definitely decide whether or not a man has recovered from miners' nystagmus, and the opinion is offered that some prolonged cases of miners' nystagmus are suffering from a vitamin deficiency.

D. H. O'Rourke.

Frigerio, A. **A case of cyclic disease of the oculomotor nerve** (Rampoldi-Axenfeld). *Riv. Oto-Neuro-Oft.*, 1928, v. 5, Sept.-Oct., pp. 389-397.

The author reports a case of Rampoldi-Axenfeld syndrome, which consists in a palpebral ptosis interrupted by periods of partial or complete elevation of the eyelids and associated with alternating miosis and mydriasis. This syndrome is congenital and not hereditary or connected with any systemic disease. The author's patient, a boy eleven years old, showed ptosis of the right upper lid, paralysis of the third and fourth, and paresis of the sixth cranial nerve. During the ptosis and during the spontaneous raising of the lid the pupil was contracted, but if the lid was forcibly raised the pupil became mydriatic. During the periods of miosis and mydriasis the pupil did not react to light or accommodation. While the lid was forcibly raised, the pupil passed from the state of mydriasis into a period of rhythmic oscillations and then into a state of marked miosis. If the eyelid which had been forcibly raised was released during the period of pupillary oscillations, it assumed an intermediary position between the ptosis and the

normal elevation. If the eyelid was released at the moment the pupil passed into miosis, it remained raised. There was thus a constant pupillo-palpebral synergy which, however, was exactly the opposite of the normal synergies of this type, that is, the Galassi phenomenon and others. (Bibliography and three figures.)

M. Lombardo.

Holm, Ejler. **A case of spasmus nutans.** *Acta Ophth.*, 1928, v. 6, no. 3, pp. 269-271.

The child was seen at the age of one year. Except for an acute otitis of two weeks' duration, occurring when six weeks old, the child was healthy. The family lived in a very dark attic and the writer attributes the nystagmus and head movements to this fact. There were intermittent rotatory movements of the head, with now and then nodding movements. The nystagmus was horizontal, more marked in the right eye, and accentuated in looking to the right. Physical examination was negative and recovery was complete after four months in hospital.

E. M. Blake.

Jaensch, P. A. **Paresis of the oblique elevator.** *Graefe's Arch.*, 1928, v. 121, p. 113.

A woman twenty-six years old, with pseudobulbar paralysis, developed paresis of both inferior oblique muscles. Accompanying this there was bilateral facial palsy producing pronounced lagophthalmus. Slight ptosis and vertical nystagmus were also present. The occurrence of isolated paralysis of both oblique elevators in pseudobulbar paralysis had not been reported. Most probably there was a lesion in the region of the nucleus of the third nerve.

H. D. Lamb.

Kestenbaum, A., and Eidelberg, L. **The convergence reaction of the pupil and the near-point.** *Graefe's Arch.*, 1928, v. 121, p. 166.

In paresis of convergence, when the near-point of convergence is exceeded there always occurs, simultaneous

with deviation of an eye to the side, a persistent dilatation of the pupils. As long as convergence is evoked, the contraction of the pupils occurs even while looking into the distance. The characteristic constriction of the pupils never occur when convergence is excluded. The narrowing of the pupil in convergence is not a transient affair like the reaction to light, but persists. There is no particular optical stimulus that produces this pupillary change, no afferent factor; therefore the pupillary change is not a reflex action. It is an associated movement, quite strongly bound up with convergence. To connect it with accommodation would not be possible because of the diminution of accommodation in advancing age. The author suggests for it the name "pupillary convergence reaction".

H. D. Lamb.

Liebermann, L. **Muscle advancement.** *Zeit. f. Augenh.*, 1928, v. 66, Oct., p. 209.

The author points out a number of objections to tenotomy as a treatment of strabismus, and presents a critical analysis of the individual procedures that constitute an advancement operation. In all procedures the chief source of failure is a cutting through of sutures in the muscle or sclera, before complete healing has taken place. To prevent this difficulty the author places two whipstitches in each edge of the muscle and anchors each separately in the sclera. After one set has cut through the tension is taken up by the second set, and before that has cut through healing is usually sufficiently advanced to prevent retraction of the muscle. With this procedure he has corrected as much as fifty degrees of esotropia with one operation. If the correction is incomplete he waits several weeks before deciding upon a second operation. Then, if more than ten degrees of deviation remain he advances a muscle of the other eye; if less than ten degrees remains he weakens the opposing muscle by partial tenotomy.

F. H. Haessler.

Maggiore, L. **Nature of amblyopia and its relation to ocular deviations in concomitant strabismus.** *Ann. di Ottal.*, 1928, v. 56, March, pp. 192-209.

Since images of objects in perspective which have three dimensions do not have identical positions on the two retinas, cerebral fusion of these images demands an associated psychic function. Amblyopia is a pathological condition mainly of central origin, resulting from a defect of the psychic center. Strabismus is also essentially a pathological condition of central origin, resulting from a defective center of motor coordination or a defective psychic center. The defect of the latter center manifests itself as a functional incapacity or a true aversion to fusion of the two retinal images, and an incomplete impulse to the motor center will follow.

The author admits two kinds of strabismus, one in which mechanical incapacity for convergence prevails (the strabismus which is surgically or in other ways correctable), and another form in which the psychic incapacity for convergence prevails (to which ultimate failure of well planned surgical methods or failure of correction by other means is to be attributed). A characteristic feature of the latter kind of strabismus is that the patient wants to see with one eye, for he has a congenital aversion to binocular vision. Instinctively he will use the good eye and will eliminate the eye which is affected by optic or anatomic defects (monocular strabismus). If the vision is good in both eyes the patient will use either one or the other (alternating strabismus). Or functional integrity of the two eyes may neutralize the tendency to frank deviation (heterophoria). (Bibliography).

M. Lombardo.

Ohm, J. **Oblique strabismus.** *Arch. f. Augenh.*, 1928, v. 99, Nov., p. 619.

Ohm, in a detailed discussion of oblique strabismus, feels that juvenile strabismus is a complicated disturbance of innervation which is associ-

ated with the central vestibular mechanism. It can appear as an isolated condition or associated with nystagmus.

Frederick C. Cordes.

Ohm, J. **Optical rotary nystagmus as an objective aid in testing the eyes.** *Graefe's Arch.*, 1928, v. 121, p. 87.

Comparison of tracings registering the movements of the eyes while fixing the author's revolving wheel has convinced Ohm of the especial importance of this test in diseases of the optic nerve. Differences between the two eyes not recognized objectively may be revealed through optical rotary nystagmus. Tracings are illustrated from a case of unilateral optic neuritis due to sinus trouble, showing the changes in the ocular movements as the condition gradually improved. Tracings are also given in a case of bilateral choked disc, in one of bilateral optic neuritis after skull injury, in a case of unilateral optic atrophy, in one with disturbance of visual conduction due to tumor of the hypophysis, in a case of bilateral optic atrophy due to brain tumor, and in one with bilateral optic atrophy after luetic inflammation.

H. D. Lamb.

Perrin, R. **Paralysis of accommodation during lactation.** *Bull. Soc. Franç. d'Ophth.*, 1928, p. 191.

Perrin reports three cases of accommodative paralysis occurring during lactation. In none of the cases could any signs of syphilis, tuberculosis, focal infection, postdiphtheric paralysis, or use of atropin be found. Treatment, consisting of suppression of lactation, administration of pilocarpin and sodium salicylate, and correcting lenses, caused complete healing in from two to three weeks. The author notes that paralyzes occur at the time when the milk appreciably diminishes in quantity and in quality and concludes that the condition is probably due to an auto-intoxication.

Phillips Thygeson.

Saba, V. **On the etiology and pathogenesis of isolated paralyzes of the abducens.** *Ann. di Ottal.*, 1928, v. 56, Aug., p. 749.

The special liability of this nerve to involvement is due to its varied anatomical relationships. Isolated paralyzes of abducens frequently occur with tumors of the fourth ventricular. Eighteen per cent of tumors associated with abducens paralysis are located at the caudate extremity of the pons. Rare cases of actinomycosis have also been noted. Fugitive paralyzes occur with multiple sclerosis, encephalitis lethargica, polioencephalitis hemorrhagica, or basilar meningitis. Other causes are discussed.

A special form of paralysis has been studied by several observers, and is known as recurrent paralysis of the external rectus. This has three clearly defined phases, that of pain, then paralysis of the abducens, and then an interval of freedom from both. The first period is characterized by a dull pain in the temporal region and under the orbit, radiating in some cases to the occiput; and occasionally by hemicrania which may be accompanied by nausea and vomiting. The nausea and vomiting are not constant and may precede the symptom of pain.

A case is recorded in an individual who was a heavy meat eater. A well balanced vegetable diet lengthened the intervals and reduced the pain. It was considered that the intestinal toxin acted directly on the abducens nucleus, disturbing the vasomotor functions of the neighboring vessels.

Park Lewis.

Sattler, C. H. **New stereoscopic pictures for children with strabismus.** *Klin. M. f. Augenh.*, 1928, v. 81, Aug.-Sept., pp. 182-184. (1 ill.)

The stereoscope pictures so far extant are not apt to develop perception of depth. Therefore Sattler devised new ones with especial attention to

this point, and describes them. (See also this Journal, v. 11, p. 1003.)

C. Zimmermann.

Vasquez Barrière, A. **Examination of disorders of ocular motility by means of the Hess chart.** Arch. de Oft. de Buenos Aires, 1928, v. 3, Sept., p. 571.

This paper describes in a practical manner the utilization of the Hess chart, with reproductions of fields of ocular motility following disturbances of various muscles. When the excursion of one eye is limited, the point of intersection of its axis with that of the opposite eye is determined, and the junction point is noted upon the Hess curtain. The limits of motility of each eye in the six cardinal positions are then noted, and when these limits are joined together upon the chart a quadrilateral figure is produced which by its departure from the normal shows not only the muscle affected, but the amount of its abnormal motility measured in degrees.

Hess divides a black curtain with horizontal and vertical lines, the interval between each representing five degrees when viewed from a distance of fifty centimeters. Two squares are delimited in red upon the curtain, the central smaller one having the six cardinal points of ocular fixation, representing each of the extraocular muscles. Externally is a larger square also containing the same points of fixation, but its use is only necessary when the deviation of the ocular axes is slight.

The patient is placed fifty centimeters from the curtain, with the eyes on a level with its center. He wears a pair of colored glasses, one being red, the other green. The red lines on the chart are visible only through the red glass. A pointer is placed in his hand, having at its extremity a green cord attached to the center of another green cord, which is in turn passed through pulleys suspended from the superior angles of the curtain, and counter weighted. The point of union of

these green cords is visible only through the glass of the same color.

With the head held immobile, the eyes of the patient are directed to the six points of fixation on the curtain, and which he sees only with the eye covered by the red glass. The point of junction of the two green cords, which he sees with the other eye, is approximated to each of the six points by means of the pointer. If there is no form of paralysis, this is done accurately and without hesitation. If one eye suffers from either a paralysis or an insufficiency, there is a retardation of its movement in the direction of action of the affected muscle.

The various positions given the green marker by the patient show not only the presence of any abnormal muscular action, but, the curtain being divided into squares of five degrees, the exact amount is also measured. The patient believes the positions of the green marker and red points coincide, since each is seen only by the corresponding eye.

The positions as indicated upon the large curtain are then recorded upon a small facsimile, on which the direction of action of each of the individual muscles is indicated for the right and left eye respectively. By connecting these points a quadrilateral is constructed, which by its position or shape indicates any deviation from the normal range of muscular action.

One of the many advantages claimed for this method is quick and unfailing differentiation of a paralysis from a spasm. In the latter there is no reduction in the total area of muscular movement, merely a displacement of the field due to the effect of the overacting muscle.

When the type and degree of muscular paralysis have been determined, it is further confirmed by reversing the glasses and trying out the field of fixation of the opposite eye. Here, due to the necessity of excessive innervation, the field will be considerably enlarged throughout the range of action of the muscle corre-

sponding to the paralyzed coworker of the opposite side.

It is found that disturbance of each muscle produces a typical form of contraction of the fixation field, and when this is transferred to the small facsimile chart it quickly identifies the muscle concerned.

A study of these disturbances of the field of fixation shows three types are possible: (1) typical reduction of the field in the range of action of the disturbed muscle; (2) amplification of the field by overaction of a muscle associated in function with one which is paralyzed; (3) displacement of the field totally but without disturbance of its form, during spasm of an extraocular muscle. Several such examples are given, and a series of charts are reproduced showing the type of disorders usually encountered.

A. G. Wilde.

5. CONJUNCTIVA

Bielaiev, I. A. **Modern trachoma therapy.** *Archiv Ophtalmologii* (Russian). 1928, v. 5, pt. 1, pp. 1-10.

A review of the newest methods in the treatment of trachoma—subconjunctival and intravenous injections of copper salts, autohemotherapy, x-ray and radium therapy, and the application of chaulmoogra oil—is supplemented by a report on the use of Besredka's antigonococcus vaccine in twelve cases of advanced trachoma. In these cases no other treatment was used, and the results of the vaccine therapy were most encouraging.

M. Beigelman.

Castresana, A. **Treatment of vernal catarrh by radium.** *Bull. Soc. Franç. d'Opht.*, 1928, p. 135.

Castresana reports six cases of vernal catarrh treated by radium. Complete or partial subjective relief was obtained in all cases, with disappearance of some of the lesions, especially the circumcorneal ones, while the tarsal lesions remained unchanged.

Phillips Thygeson.

Cole, Wm. H., and Weed, B. C. **Loss of pigment by regenerated conjunctiva in frog tadpoles.** *Jour. of Exper. Zoölogy*, 1928, v. 51, July, pp. 163-176.

The amount of pigment in the regenerated conjunctiva after excision is directly proportional to the amount of pigment in the immediately surrounding skin. Pigment arrives by migration. When an eye is present under the new conjunctiva the latter becomes depigmented. When no eye is present the new conjunctiva becomes like adjacent skin.

Lawrence T. Post.

Dantrelle. **Surgical treatment of trachoma by cold spark.** *Ann. d'Ocul.*, 1928, v. 165, Dec., pp. 897-902.

Good anesthesia is necessary. This is obtained by subconjunctival injection of four per cent novocaine after double eversion of the lid. The technique of diathermo-coagulation is described. The method is regarded as of great value because the resultant scarring does not penetrate more than from one to one and one half millimeters.

Lawrence Post.

De Caralt, D. **Hyaline and amyloid degenerations; plasmoma and conjunctivitis petrificans.** *Arch. de Oft. Hisp.-Amer.*, 1928, v. 28, May, p. 257.

The author records a lengthy pathological study and description of amyloid degeneration of the conjunctiva, confining himself to the local process. Although this condition is very common as the result of trachoma it can be found also in some other conditions. In amyloid degeneration a special protein exists in the conjunctiva, and gives reactions similar to those of starch. According to Neuberg and Schieck it is a combination of sulphate of chondroitin with an albumin produced by the cells. Rund and Deutschmann consider amyloid not as a degeneration but as a true tumor, as there are no transitional forms between the leukocytes and the plasma cells. For this reason they call it plasmoma. Cajal thinks

that the amyloid masses are not homogeneous, as they have a fine network of connective tissue strands, continuous with the adventitia of the vessels.

From the pathological standpoint, hyalin and amyloid or plasmoma differ from each other. This is also proved clinically by the isolated cases which remain in either of these conditions for many years. The author studies the symptoms of these degenerations and also those of conjunctivitis petrificans (Leber).

M. Uribe Troncoso.

- * Scalzitti, G. **The behavior of the conjunctiva under varying conditions of hygiene, alimentation, and therapy.** *Ann. di Ottal.*, 1928, v. 56, Aug., p. 726.

Experiments were made on rabbits and guinea pigs to test the resistance of the eye to mycotic infection under varying conditions. The mold varieties employed were *aspergillus fumigatus* (mold fungus) and *glenspora graphii*. Some animals were placed under good hygienic conditions with abundant light and fresh air, others were kept in cages. The conjunctiva was traumatized and inoculated. In some instances after inoculation an iodine base was injected in the animal. Certain of the animals were given nutritious food and placed under poor hygienic conditions while those that were starved were allowed freedom of light and sunshine. In the animals treated with iodine injections an increased redness was observed around the nodules caused at the site of inoculation, and this was followed by more rapid disappearance of the inflammation. Healing was quicker and more complete, even in animals that were undernourished, when they were given light and air.

Park Lewis.

Taborisky. **Etiology of epitarisus.** *Klin. M. f. Augenh.*, 1928, v. 81, Oct., pp. 487-498. (12 ill.)

Taborisky observed in Southern Russia fourteen cases of epitarisus, i.e.,

a duplication of conjunctiva starting from the retrotarsal fold and inserting into the tarsus, so that it can be undermined with a probe. It occurs more frequently in warm countries. Five cases are described in detail, one with histological examination of the excised epitarisus. There is no sufficient proof of a congenital anomaly, but direct observations are in favor of epitarisus being due to acute inflammation of the conjunctiva, most likely blennorrhea neonatorum (gonococci and inclusions) and pseudo-membranous conjunctivitis. In Palestine, where it occurs much more frequently, it is caused by pseudo-membranous conjunctivitis and probably by acute trachoma (with and without mixed infection). Epitarisus occasionally produces deformities of the lids and favors retention and development of bacteria, so that prompt separation of the adherent folds is imperative. *C. Zimmermann.*

Thomas, A. B. **Staphylococcus aureus conjunctivitis of the newborn.** *Jour. Infect. Diseases*, 1928, v. 43, p. 306.

The author concludes that an acute purulent conjunctivitis may occur in infants without evidence of a preexisting vaginitis in the mother. In one hundred consecutive cases of purulent conjunctivitis of the newborn, none appeared to be caused by the gonococcus. Cultures of *Staphylococcus aureus* isolated from the conjunctival and other lesions that were present seemed to belong to a single strain, which was atypical in staining qualities, in metabolic reactions with carbohydrates, and in pathogenicity for animals. This organism was considered the causative agent in all the cases. It was probably transmitted through contaminated olive oil or boric acid, or both. *A. G. Wilde.*

Veil, P. **Nevocarcinomas of the conjunctiva.** *Bull. Soc. Franç. d'Opht.*, 1928, p. 178.

Veil gives a complete clinico-pathologic study of a case of nevocarcinoma of the limbus treated first

by radium without success, and later by wide excision. There was no local recurrence, but glandular metastases developed, disappearing under radiotherapy. Still later a nodule appeared in the upper lid, adherent to the tarsus and palpebral conjunctiva, and was treated successfully by excision and graft. Three years after onset of the tumor the patient died of visceral metastases without having had ocular, palpebral, or lymph gland recurrence. The author believes that the prognosis of the conjunctival type is better than that occurring in the skin, in that general metastases occur less frequently. Wide excision followed by electrolysis or cauterization of the base of implantation of the tumor should be followed by complete healing.

Phillips Thygeson.

Vigouroux, V. Prophylaxis of actinic conjunctivitis in moving picture artists. Bull. Soc. Franç. d'Opht., 1928, p. 128.

Vigouroux comments on the great frequency of ultraviolet light conjunctivitis among cinema artists and employees. Individuals with blue or prominent eyes seem particularly susceptible. Chronic conjunctival hyperemia is usually found and the author has repeatedly noted the frequency of early presbyopia in persons with no manifest or latent hyperopia. Measures used for protection, such as tinted lenses, oily collyria, or ointments, have for one reason or another been unsuccessful. Proper screening of the lamps seems to be the best means of prophylaxis, and is said not to impair the photographic results. These screens must be of sufficient thickness to stop all the ultraviolet rays, and the lamp must also be covered at the sides to protect the operators. When sunlight alone is used the screening problem is more difficult but can be solved in a similar manner.

Phillips Thygeson.

6. CORNEA AND SCLERA

Argañaraz, Raul. Contribution to the clinical study and pathology of

scleritis and episcleritis. Arch. de Oft. de Buenos Aires, 1928, v. 3, Nov., p. 677.

The anatomy, etiology, symptomatology, and treatment of these related conditions are discussed in detail. The treatment consists mainly in search for and elimination of the cause. Locally, attempts are made to alleviate the inflammation of the uveal tract by sodium salicylate, aspirin, colchicum, potassium iodide, mercury, and atophan. Laxatives, alkaline waters, and copious diaphoresis may be of value. Locally hot compresses, dionin, and atropin are used, and massage seems to favor the absorption of exudates in cases which are not painful.

A. G. Wilde.

Blegvad, Olaf. Corneal tattooing with gold chloride. Acta Ophth., 1928, v. 6, no. 3, pp. 272-274.

On account of a congenital leucoma. Blegvad tattooed the cornea of a young woman. The pupillary area was outlined by a large trephine and the epithelium scraped off. The radiating lines of the iris were represented by linear scratches radiating from the pupillary area. A solution of five per cent gold chloride was applied and a one per cent solution of tannin dropped upon this. The cosmetic result was most satisfactory.

E. M. Blake.

Borel, G. Radiation and blue rays. Bull. Soc. Franç. d'Opht., 1928, p. 163.

Borel reviews the literature and discusses the effect of various rays on the ocular tissues. X-rays in particular have been known to produce corneal injury, chemosis, conjunctivitis, ptosis, and even glaucoma. He concludes that infrared, ultraviolet, caloric, and Roentgen rays are frequently dangerous, having severe delayed effects, and consequently should be used with great caution. He cites a personal observation of a man aged seventy-eight years, operated on for cataract, who had five consecutive x-ray treatments for facial eczema, followed by total loss of beard, eye-

brows and lashes, and by severe corneal injuries, iritis, chemosis, ptosis, and almost complete blindness. The corneas had the appearance of keratomalacia. They wrinkled and folded at the least pressure, and later developed a milky opaqueness. Because of the known antagonism existing between the very short rays and the long rays, blue radiation was resorted to in treatment, with very favorable effects. The vision, which had fallen from 0.4 to 0.01, returned to 0.2. However, there were recurrences of iritis, corneal trouble, and deep pannus. Borel asks if the theory of antagonism between the radiations of different length does not explain the favorable action of sunlight on radio-dermatitides. *Phillips Thygeson.*

Braun, G. **Stereoscopic vision after keratoplasty and strabismus operation.** *Arch. f. Augenh.*, 1928, v. 99, Nov., p. 654.

Braun's patient had a parenchymatous keratitis which left a corneal scar in one eye with subsequent divergence. After keratoplasty, the patient developed 6/6 vision in the operated eye, which produced a diplopia. Following operation for his divergence, stereoscopic vision was again established. *Frederick C. Cordes.*

Carrère, L. **Tuberculosis of the cornea.** *Ann. d'Ocul.*, 1928, v. 165, Nov., pp. 853-865.

The author produced tuberculosis of the cornea in animals by subconjunctival inoculations near the limbus; also by scleral and by postiridic injections. The lesions produced are described and illustrated.

Lawrence T. Post.

Cucchia, A. **Evolution of corneal curvature in human fetuses.** *Ann. di Ottal.*, 1928, v. 56, June, pp. 504-509.

Instead of using the Young method, or the Helmholtz or Javal-Schiøtz ophthalmometer, Cucchia put the enucleated eyes of fetuses, cornea down, in a soft paste of plaster of Paris. The cornea was found to be

perfectly modelled in the hardened plaster, when the globes were removed and some melted lead was poured into the molds. Either the external surface of the lead form or the internal surface of the plaster one could be used for measuring the radius of curvature. The radius of curvature increased up to the end of fetal life. In fetuses of 3.5, 5, 5.5, 7, 7.5, and 9 months, the radius was respectively 2.15, 3.10, 5.12, 6.8, 6.54, 6.71, and 7.50 millimeters. (*Bibliography.*) *M. Lombardo.*

Cuénod and Nataf. **A method of treating trachomatous pannus.** *Rev. Internat. du Trachôme.* 1928, v. 5, Oct., p. 129.

The following technique has been used in thousands of cases of mild and extensive trachomatous pannus over a period of more than twenty years: Thorough local anesthesia, with instillations of cocaine and subconjunctival injections of novocaine, is followed by thorough grattage of the palpebral and bulbar conjunctiva, and also of the cornea. Superficial nodules in the subepithelial layer are removed, and the vessels are destroyed by peritomy. Much importance is attached to subconjunctival injection of cyanide of mercury at the upper edge of the cornea, above the pannus. This is followed by general conjunctival massage with powdered boric acid, then a "wash" of copper sulphate, instillation of atropin, and "campho-copper" ("campho-cuivre").

This heroic treatment produces marked swelling of the lids, with bulbar chemosis, which subsides in six to eight days. Symblepharon is prevented by inserting iodoform ointment between the lids every day. Intense iritis, seen occasionally, subsides within a few days. No aggravation of pannus, nor other complication, has been noted. *George H. Stine.*

Donnell, N. R. **Ulceration of the sclera.** *Arch. of Ophth.*, 1929, v. 1, Jan., pp. 87-90.

The author reviews the literature of this condition and comes to the

conclusion that the lesion is remarkable for its rarity. He reports two cases; the first in a boy aged ten years, in whom there was a large ulcerated area on the temporal side of the left eye. He had no pain. Vision was normal, as was the fundus. There was a definite stigma of congenital lues. The condition cleared promptly on vigorous antiluetic treatment. The second case, in a woman of thirty-five years, presented a small ulcer on the conjunctiva of the right eye. The excavation was about three mm. in diameter, the bottom covered with necrotic tissue, surrounded by a deeply infiltrated elevated area. The patient reacted definitely to 0.001 mg. of old tuberculin, and the lesion cleared within two weeks, leaving a facet corresponding to the original ulcer. The author feels that these two cases substantiate the recognized opinion that ulcers of the sclera are due to some deep-seated infectious process.

M. H. Post.

Franceschetti, A. **Hereditary recurrent corneal erosion.** Zeit. f. Augenh., 1928, v. 66, Nov., p. 309.

It has generally escaped notice, though it has been pointed out by Szily, Franks, and Salus, that there is a nontraumatic as well as a traumatic form of recurrent corneal erosion. The author presents the findings in a large family with many branches in which fifty-four per cent of the members of six generations were affected. The children of normal members were normal. This points to simply dominant mendelian inheritance. The demonstration of the distinctly hereditary nature of nontraumatic recurrent corneal erosion suggests investigation of the relation of the lesion to other hereditary corneal lesions such as nodular opacities of Groenouw and the lattice-shaped opacities of Haab, which are also dominantly inherited lesions. That the epithelial dystrophy of Fuchs is related to recurrent erosion is suggested by Gifford's observation of one of these lesions in one eye of

a patient and the other lesion in the other eye. Possibly the traumatic recurrent erosion of the cornea also arises on a hereditary basis.

F. H. Haessler.

Hoffmann, H. **Therapy of serpent corneal ulcer.** Klin. M. f. Augenh., 1928, v. 81, Oct., pp. 508-509.

In severe cases of serpent ulcer Hoffmann recommends broad opening of the anterior chamber at the limbus with the Graefe knife.

C. Zimmermann.

Kaufmann, P. **Experimental investigation of optochin cataphoresis.** Arch. f. Augenh., 1928, v. 99, Nov., p. 644.

Kaufmann experimentally produced pneumococcus ulcers in rabbits and then treated them with optochin cataphoresis. He found that this had a decidedly beneficial effect on the condition. He also reports four cases of serpiginous ulcer in patients, that were successfully treated by this method. In two of the cases, larger doses than ordinarily used were employed. These cases apparently had less scarring. The author hopes that more cases will be treated by this method, so that cataphoresis will assume the place that it deserves in the treatment of serpent ulcers.

Frederick C. Cordes.

Poleff, L. **Production of antibodies in vitro by corneal tissue.** Arch. f. Augenh., 1928, v. 99, Nov., p. 515.

To corneal tissue growing in vitro, Poleff added a toxin. After a given time had elapsed, this was instilled into the right eye of rabbits, while in the left the toxin alone was used. In these experiments, the left or control eye developed a severe conjunctivitis, while in the right only a mild reaction took place. From his experiments, Poleff concludes that active immunization of tissue cultures is possible, and that antibody production takes place not only in mesenchymal organs, as the spleen, but also in cultures of corneal tissue. The

work done so far does not warrant any definite opinion as to the immunizing properties of the eye.

Frederick C. Cordes.

Rötth, A. **The involvement of the cornea in erythema nodosum.** *Zeit. f. Augenh.*, 1928, v. 66, Nov., p. 323.

In association with erythema nodosum the author observed a lesion in the bulbar conjunctiva of which four cases have been described in the literature. The conjunctiva in the lid slit, chiefly on the nasal side, becomes edematous, after which a nodule surrounded by a zone of infiltration develops. The nodule involves the subconjunctiva, and may reach the episclera and disappear with the erythema nodosum in a few days. The disease is painless and the prognosis good. Treatment is unnecessary. The picture is characteristic of erythema multiforme as well as of erythema nodosum. It has recently been suggested that erythema nodosum is a tuberculous disease. However the conjunctival lesion differs distinctly from a tuberculous episcleritis. There is neither pain nor photophobia and only very slight epiphora. The hyperemia is superficial, and the violet color characteristic of episcleritis is absent. In the author's case the lesion started definitely in the conjunctiva and involved the deeper tissues later, and the lesion on the nasal side in this case was distinctly over the internal rectus muscle.

F. H. Haessler.

Schreiber, Z. **Treatment of parenchymatous keratitis with malaria.** *Zeit. f. Augenh.*, 1928, v. 66, Nov., p. 316.

In twenty-three cases with thirty-five eyes involved in parenchymatous keratitis the author injected intravenously five c.c. of blood containing pure strains of tertian malaria plasmodium. In favorable cases the blepharospasm, epiphora, and photophobia disappeared after the second or third attack of fever. Iris hyperemia decreased and further formation

of synechia was prevented. During the fever the intraocular tension became strikingly low. Despite the disappearance of hyperemia the dullness and infiltration of the cornea remained unchanged. The treatment did not prevent involvement of the second eye in cases which were unilaterally infected when treatment was initiated, nor did it check the course of incipient cases. Even in this small series a recurrence was noted during treatment. However, in many cases the course was shortened, the dangerous complications were avoided and the scarring of the cornea was less dense.

In one case the lesions became worse, ending in ulcerous dissolution of the cornea which necessitated enucleation. This is so unusual an occurrence that it does not seem unlikely that it was caused by treatment.

F. H. Haessler.

Scullica, F. **Experimental corneal ectasia from lesions of Descemet's membrane.** *Ann. di Ottal.*, 1928, v. 56, March, pp. 239-249.

Some writers think that the finding of a rupture of Descemet's opposite the most prominent part of the ectasia in keratoconus might throw some light on the pathogenesis of this disease. In order to find how far the integrity of this membrane is responsible for maintenance of the normal curvature of the cornea, the author made experiments on the cornea of rabbits and dogs, and on the cornea of a blind eye. He penetrated the anterior chamber and made a cross incision on the posterior surface of the cornea, or removed with a curette the endothelium from the central part of the posterior surface to the margin of the incision. He followed the changes that took place in the membrane, and comes to the conclusion that such lesions of Descemet's do not explain the pathogenesis of keratoconus but that all the tissues of the cornea participate in the pathologic process. (Bibliography).

M. Lombardo.

Scullica, F. **The importance of the constitutional element in the etiology of keratoconus.** *Ann. di Ottal.*, 1928, v. 56, Aug., p. 693.

In 1904 Dor noted a case of keratoconus in morbus basedowii, modified after thyroidectomy. Various theories were given as to the reasons for the ectasia. De Lapersonne and Terson have found keratoconus in individuals associated with trophic abnormalities of the skin and its appendages. Other authors have thought it dependent upon imbalance of the endocrine glands. Scullica reports five cases in detail and concludes that they do not warrant an acceptance of the view of glandular etiology. He fails, however, to remark on the fact that in two of the cases tuberculosis was present and in each of the others the family history gave evidence of the existence of a tuberculous diathesis.

Park Lewis.

Stock. **Parenchymatous keratitis in sleeping sickness.** *Klin. M. f. Augenh.*, 1928, v. 81, Aug.-Sept., pp. 192-193.

A man aged twenty-two years had worked two years in Fernando Po and had been infected by trypanosoma gambiense, as the examination of the blood revealed. At the hospital he complained of impaired vision from diffuse parenchymatous keratitis and iritis. Undoubtedly the trypanosome had entered the cornea and caused the inflammation. Injection of germanin 0.50, and after two days 1.00, not only cured the keratitis, but also freed the patient from the trypanosome.

C. Zimmermann.

Yazujian, D. M. **Spreading ulcer of the cornea.** *Jour. Med. Soc. New Jersey*, 1928, v. 25, Nov., p. 699.

In six of the seven cases reported, puncture with the author's needle cautery promptly checked the progress of the ulcer. Complications such as hernia of the iris, luxation of the lens, or intraocular hemorrhage were not encountered; due, perhaps, to the minute size of the puncture prevent-

ing sudden outpouring of the aqueous. This radical measure is not recommended for non-spreading ulcers of the cornea. (Discussion.)

George H. Stine.

7. UVEAL TRACT, SYMPATHETIC DISEASE, AND AQUEOUS HUMOR

Abe, T., and Komura, K. **The diffusion of iodides into the aqueous humor of rabbits' eyes.** *Graefe's Arch.*, 1928, v. 121, p. 294.

It was found that the transference of iodides from the blood into the aqueous humor was dependent upon diffusion activity between both fluid systems in the physicochemical sense. The highest concentration of substances in the aqueous humor is evidently dependent upon the initial concentration of the blood, that is upon the injected amount of the substance.

H. D. Lamb.

Bargy, Maurice. **Three cases of iridocyclitis due to trypanosomes.** *Bull. Soc. Franç. d'Opht.*, 1928, p. 43.

Three cases of iridocyclitis due to trypanosome infection are reported, in natives of Africa, all presenting the four characteristic signs, unilaterality, fugacity, benignity of the lesions, and frequent recurrence. The author adds a fifth sign, never before mentioned; namely, iris hemorrhages due, without doubt, to trypanosomal emboli. The presence of these five signs in a patient coming from regions subject to African sleeping sickness should suggest the possibility of an ocular complication of the disease. The general symptoms and diagnosis are discussed, with emphasis on blood examination, and lymph gland and anterior chamber picture for actual identification of the parasites. The prognosis of the ocular complication is good, only insignificant sequelae being left. For treatment, atoxyl gives by far the best results, and in over a thousand therapeutic injections no optic nerve accidents resulted. It is interesting to note that the three cases reported all eventually succumbed to the disease.

Phillips Thygeson.

Bretagne. **Biomicroscopic appearance of a formation encountered in certain blue irises.** Bull. Soc. Franç., d'Opht., 1928, p. 37.

On certain blue irises, near the limbus and concentric with it, Bretagne found strings of tiny yellowish white dots, visible to the naked eye. Under the biomicroscope they appeared as small elevations, often oval, with long axes parallel to the limbus, and the largest having a diameter of approximately half a millimeter. At first Bretagne thought the condition associated with a very early mild iritis, but in none of the cases was he able to find any other clinical signs. He believes these spots to be collections of chromatophores and regrets that a histologic examination can not be made. *Phillips Thygeson.*

Bücklers, Max. **Anatomical observations on the relations between senile and myopic circumpapillary atrophy of the choroid.** Graefe's Arch., 1928, v. 121, p. 243.

The author thinks that his anatomical examinations of senile eyes prove that the explanation of myopic atrophy of the choroid as due to mechanical thinning or pressure action is no longer tenable. Fourteen eyes from seven nonmyopic individuals varying between seventy-nine and eighty-eight years in age showed changes similar to those identified with myopia, as atrophy of the choroid, degeneration of the choriocapillaris, cleft-like openings in the choroidal lamina vitrea, atrophy and proliferation of the pigment epithelium, backward turning of the limitans externa, pointed extensions of the nerve-fibers, cystoid degenerations of the ganglion cell and nerve-fiber layers, and fatty degeneration of the choroidal lamina elastica and of the sclera. In both senile and myopic eyes these changes progress with age and are dependent upon hereditary influence, as are all senile alterations.

H. D. Lamb.

Hambresin, L. **Congenital vascular dilatation of the iris.** Bull. Soc. Franç. d'Opht., 1928, p. 27.

Hambresin points out that the corneal microscope does not enable one to see the numerous vessels in the stroma of the iris and that consequently any vessel seen, especially if tortuous and distended, should be regarded as abnormal. He describes the case of a young man, aged twenty-one years, whose right iris contained a very tortuous and dilated vessel, appearing at the 7:30 o'clock position and disappearing again at 11:00 o'clock. There was no branching nor pulsation and the patient stated that the condition had been present unchanged throughout his entire life. A diagnosis of congenital varix of the iris was made. Two years later the patient returned complaining of sudden loss of vision in the right eye. Examination revealed a large intravitreal hemorrhage with many floaters. At the end of three weeks the blood had absorbed sufficiently to make out fundus details. Two important hemorrhages were found in the temporal retina at the limit of ophthalmoscopic vision, located just behind the varix of the iris. Hambresin asks if these hemorrhages were not due to rupture of this vein. *Phillips Thygeson.*

Koby, F. E. **Hyperpigmented warty iris.** Bull. Soc. Franç. d'Opht., 1928, p. 34.

Kolby reviews the literature and describes one case of verrucous hyperchromatosis of the iris. He discusses the possible origin of these wart-like elevations and calls attention to the fact that they are only encountered in eyes having excessive pigmentation. *Phillips Thygeson.*

Kumer, L., and Sallmann, L. **Discoloration of the iris from röntgen rays.** Graefe's Arch., 1928, v. 121, p. 238.

Sallmann had noticed, after röntgen raying of children's eyes for angioma of the lid, a darkening of the color of

brown irides in six out of ten cases. In gray or blue eyes the change was less pronounced. Among the eyes of eighteen adults exposed to x-rays because of carcinoma of the lids, a similar discoloration of the iris occurred five times; three times in brown irides, once in a blue, and once in a dark greyish-green iris.

H. D. Lamb.

Onfray, René, and Margerin. **Remains of pupillary membrane adherent to the cornea.** Bull. Soc. Franç. d'Opht., 1928, p. 31.

Onfray and Margerin report in detail two cases in which remnants of pupillary membrane stretched from the anterior surface of the iris to the posterior surface of the cornea. It is interesting that the mother of one of the patients had been presented before the Ophthalmological Society of Paris in 1914 with an almost exactly similar picture. The authors believe that the condition results from a light attack of iritis, intrauterine, when the pupillary membrane is still in existence.

Phillips Thygeson.

Panico, E. **Tubercle of the choroid.** Ann. di Ottal., 1928, v. 56, Aug., p. 735.

In the right eye of a woman of twenty-three years having acute miliary tuberculosis two forms of choroidal tuberculosis were associated, the tuberculoma and the miliary tubercle. In the left eye was only the miliary type.

Park Lewis.

Redslob, E. **On the dilating apparatus of the iris.** Bull. Soc. Franç. d'Opht., 1928, p. 4.

Redslob recalls the differences of opinion concerning the dilating apparatus of the pupil, some denying the existence of a dilatator and believing that enlargement of the pupil occurs simply by relaxation of the sphincter. Others admit the existence of a dilatator but localize it either in certain branched elements in the iris stroma or in the iris vessels, which, by changing their caliber, are able to

modify the size of the pupil. Redslob answers the first by noting the appearance of the dilating iris under the biomicroscope, when it can be seen that the whole iris mass moves and not alone the pupillary border, which would occur if relaxation of sphincter tonus were the sole mechanism of dilatation. As no elastic fibers can be demonstrated in the iris, it follows that a dilatator organ must exist, stretching from border to border of the iris. The principal argument against the dilating function of the myoepithelial layer, described by Grynfeldt, is the disproportion in size between it and the sphincter, the latter being much thicker. Redslob, by careful measurements on twenty normal human eyes, is able to show that what the dilatator loses in thickness it more than gains in length, the total volume being more than three times greater. If the strength of a muscle corresponded to its volume, the dilatator would then be three times as powerful as the sphincter. These conclusions must be restricted because of the fact that the dilatator is composed of myoepithelial elements while the sphincter is composed of smooth muscle, both however derived from ectoderm. Redslob next describes the histology of the myoepithelial layer and concludes with an optical study, showing that these elements are doubly refracting as are all other muscular fibers, and thus bringing additional proof of the muscular nature of Henle's layer.

Phillips Thygeson.

Safar, Karl. **Circular line formation in the iris secondary to pronounced softening of the eyeball.** Graefe's Arch., 1928, v. 121, p. 106.

In two young individuals, one seventeen and the other four years old, there occurred softening of the eye, in the first after a penetrating scleral wound from a red-hot piece of iron and the other following congenital dislocation of the lens in the absence of injury or operation. In the iris of each case after the soften-

ing there were noted reddish-brown sharply circumscribed circular lines. The author concludes that these lines were due to wrinkling of the iris secondary to shrinking of the fibrous capsule of the eyeball.

H. D. Lamb.

Tron, Eugene. **Contribution to the chemistry of the regenerated aqueous humor.** Graefe's Arch., 1928, v. 121, p. 329.

The author's experiments on rabbits lead him to the following conclusions: In the second aqueous humor formed after corneal puncture, there is an increase in the contents of the kations (potassium, calcium) and a diminution in the concentration of anions (chlorine) as compared with the first aqueous humor. Ascher's rule, that with every increase of albumen in the aqueous humor there is a diminution in the amount of chlorine, is true in the most diverse experimental conditions. According to their chemical characteristics, both the first and the second aqueous humors can be considered as ultrafiltrates of the blood. The second aqueous differs from the first because at the time of the former a dilatation of the vessels of the ciliary body is present and results in pronounced permeability of the vessel wall for the colloids of the blood. The difference in anion and kation content between the first and second aqueous humors is also the result of high permeability of the vessel wall. It is dependent partly upon the breakdown of the equilibrium normally existing between aqueous and blood serum and partly upon transference into the aqueous of that part of the crystalloids which on account of being combined with blood colloids are not dialyzable. *H. D. Lamb.*

8. GLAUCOMA AND OCULAR TENSION

Comberg, W. **On control of the tonometer of Schiötz.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 289-298. (8 ill.)

Comberg established in Berlin a laboratory for standardizing Schiötz

tonometers made by different factories, and discusses the principles of the procedure. He recommends this also for other countries.

C. Zimmermann.

De Salvati. **Intraocular tension in the course of intracranial hypertension.** Ann. d'Ocul., 1928, v. 165, Dec., pp. 919-921.

Human cases and experiments on monkeys indicated that there was no association between intracranial and intraocular tension. *Lawrence Post.*

Hamburger, Carl. **Intraocular tension and ocular inflammation.** Klin. M. f. Augenh., 1928, v. 81, Nov., pp. 616-625.

Hamburger discusses his view that the principle of reducing tension in the treatment of glaucoma is ciliary inflammation. He reviews the literature, and concludes by saying that one of the most important tasks of ophthalmology is to find an appropriate and controllable type of inflammation. *C. Zimmermann.*

Horniker, E. **Clinical observations on relations between general blood-pressure, ocular circulatory disturbances, and glaucoma.** Graefe's Arch., 1928, v. 121, p. 347.

A difference in blood pressure between the two brachial arteries was found in an astonishingly high percentage of cases having the author's vaso-neurotic signs, such as certain opacities in the corneal epithelium and endothelium and in the lens (Graefe's Arch., 1928, v. 119, p. 488). In these cases the lower blood pressure is much more frequently on the left side of the body. Most of the cases however reveal constant fluctuations in height of general blood pressure, and shifting of the lower blood pressure from one side of the body to the other. The first stage of glaucoma is very frequently accompanied by sudden attacks of increased blood pressure, with differences in pressure between the two sides, and most frequently the greater fluctuations in

blood pressure are found on the same side as the glaucomatous eye. Intraocular and subconjunctival hemorrhages (with the exception of thrombosis of the retinal vessels) occur with especially frequency on the side showing sudden changes in general blood pressure. *H. D. Lamb.*

Knapp, Arnold. Glaucoma in generalized vascular nevus of the skin. Report of case with angiomatous changes in the iris. *Trans. Amer. Ophth. Soc.*, 1927, v. 25, p. 154.

P.H., aged eleven years, had a generalized vascular nevus of the skin of the face and body and a drooping of the upper left eyelid. The nevi appeared on the gums and hard palate. They resembled the ordinary birthmarks.

Vision R.E.—6.50 sph. = 20/200; L.E.—5.50 sph. = 20/200. The diameter of each cornea was 13 mm. The anterior chamber was deep, the cornea clear. The iris was a dull grayish-blue; there was superficial atrophy; a network of superficial branching white lines and some dilated vessels were visible. The most striking features were numerous nodules scattered over the iris. With the slit-lamp they were grayish, somewhat translucent, not related to the blood-vessels, and superficial to the iris stroma. The nodules were not changed by tuberculin after eight months observation. The pupils measured 5 mm. The right disc showed a deep cut with atrophy. There was concentric contraction to thirty degrees in the right eye and to forty degrees in the left. Tension, R.E. 50 mm., L.E. 62 mm. (Schiotz).

The microscopic sections showed thickening of the iris from proliferation of endothelial cells, with many new-formed vessels. This suggested an angiomatous condition. Toward the surface in some places the cells were crowded together and in layers, forming nodular protuberances. They offer a ready explanation of the glaucomatous process.

John A. McCaw.

Taratin, P. I. On the action of pituitrin upon the eye. *Russkii Opht. Jour.*, 1928, Dec. pp. 716-726.

In twenty-eight cases of acute, chronic inflammatory, simple, and absolute glaucoma, subconjunctival injections of pituitrin were followed by marked decrease of intraocular pressure and by improvement in central and peripheral vision. The action of pituitrin was often superior to that of miotics, and the effect of a single injection lasted for several days. No untoward results were noticed.

M. Beigelman.

9. CRYSTALLINE LENS

Gaiser, Hans. The lens with a double focus. *Graefe's Arch.*, 1928, v. 121, p. 145.

Brief histories are given of nineteen individuals, having twenty-eight eyes each of which contain a lens with double focus. Examination of these twenty-eight eyes with the slit-lamp showed the lens of double focus to have early cataractous changes in the nucleus and an unaffected cortex. The double focus is therefore explained by increase of the refractive index at the nucleus. In all these cases myopia was present; in eleven cases an increase of myopia had occurred in the previous eight to forty-eight months. In one case the difference in refraction between the central and peripheral part of the lens amounted to 27.00 D. Refraction after operation in four cases demonstrated that the previous myopia had been confined to the lens.

H. D. Lamb.

Lasareff, E. G. A new cataract theory. *Russkii Opht. Jour.*, 1928, Dec., pp. 710-715.

During accommodation the ciliary processes are apt to come into contact with the equator of the lens, more often in advanced age when the lens is greatly increased in its frontal diameter. When this contact assumes the character of pressure, a disintegration of the lenticular capsule may occur and the aqueous may slowly

penetrate into the lenticular substance with resulting cataract formation. The article is a preliminary report on a series of interesting experimental and clinical observations.

M. Beigelman.

Manes, A. J. **Refinements of cataract extraction.** *La Semana Medica*, 1928, v. 50, Dec. 13, p. 1663.

The technique described is largely that of the Elschmig Clinic at Prague. Preliminary akinesia is always practiced by injecting five c.c. of 0.5 per cent novocain with adrenalin into the orbicularis. A suture is passed under the superior rectus in the form of a loop, which at once depresses the eye, holds it firmly, and elevates the lid. Retrobulbar injection is made of 0.5 c.c. of the same solution employed in the muscle, which decreases congestion of the choroid, and diminishes tension. Its anesthetic action is exerted upon cornea, iris, and ciliary processes. Operation is done on the patient's own bed, which is arranged to be elevated to any desired height.

A. G. Wilde.

Rollet. **Glass worker's cataract.** *Arch. d'Opht.*, 1929, v. 46, Jan., p. 5.

The literature is reviewed with regard to the frequency and type of cataract in glass workers. The process of making glass bottles by hand is very interestingly described. The workers start as assistants at an age of from twelve to fourteen years. The work is done before an open furnace to which the left side of the face is most exposed. This accounts for the greater preponderance of glass blower's cataract in the left eye. It differs markedly from senile cataract in its early stages in that the onset is in the posterior subcapsular region. The opacity advances, involving the nucleus, and when mature it has no specific characteristics to determine its origin. As a general rule exposure for a number of years is necessary for the development of glass blower's cataract, and one must not forget that

senile cataract may develop in glass workers. But the typical glass blower's cataract appears from one to three decades earlier than the usual senile cataract. The cause may be the infrared rays acting directly on the lens or uveal damage from the intense heat. The workers will not wear glasses, but the affection is rapidly disappearing due to the adoption of machinery which eliminates blowing of bottles by hand.

M. F. Weymann.

Samoilov, A. I. **Posterior lenticonus.** *Russkii Opht. Jour.*, 1928, Dec., pp. 731-736.

The results of a detailed slit-lamp examination in a case of posterior lenticonus are reported. The author established a close relationship between the lenticonus and remains of the lenticular vascular tunic in the form of peculiar folds at the position of the posterior shagreen of the lens.

M. Beigelman.

-10. RETINA AND VITREOUS

Abe, Zetsuo. **Visible blood stream in the retinal veins.** *Klin. M. f. Augenh.*, 1928, v. 21, Aug.-Sept., pp. 199-204. (1 ill.)

The right eye of a woman aged twenty-eight years, who had neither arteriosclerosis nor an affection of the heart, showed a retarded granular stream in the retinal veins, having the appearance of sand moving in transparent red glass tubes. Slight pressure on the eyeball increased the velocity of the current. On the inferior nasal artery, at a distance of four disc diameters from the disc margin, a cystic ectasia of the wall was noticeable. Apparently the phenomenon was due to impeded flow of blood through the central retinal artery, which was more or less narrowed. This assumption was borne out by the results of comparative measurements of the pressure of the retinal vessels in both eyes with the tonometer and ophthalmodynamometer (Baillart), which demonstrated marked diminution of systolic and

diastolic arterial pressure in the diseased eye, while there was no considerable difference of intraocular tension between both eyes. Wassermann reaction was positive, so that probably the narrowed lumen of the arteries was produced by syphilitic endarteritis.

C. Zimmermann.

Bettremieux. **What is the best treatment of detachment of the retina?** Arch. d'Ophth., 1928, v. 45, Dec., p. 773.

Attention is called to the writer's technique of nonperforating pericorneal sclerectomy. For the treatment of glaucoma and retinal detachment he has used this procedure for twenty-five years, and when done early he has obtained definitely satisfactory results. The principle involved is that by opening the venous spaces around the cornea increased circulation is produced in the eye and its nutrition is improved. His procedure is different in principle from the sclerectomy of Parinaud which drains off intraocular fluid, and from the operations producing sclerochorioretinal cicatrices. He believes his procedure to be the best so far devised for treatment of detachment of the retina.

M. F. Weymann.

Claude, H., Lamache, A., and Dubar, J. **Retinal hypertension in the diagnosis of intracranial hypertension.** Trans. Neurol. Congress, Paris, 1928. Rev. Neurol., 1928, 35th year, v. 2, July, pp. 91-94.

A diastolic retinal arterial hypertension of 45 mm. Hg or more was found to exist for a long time before the appearance of papilledema in twenty-four out of twenty-six cases of intracranial hypertension. The retinal hypertension and the intracranial hypertension appear to run almost parallel. In one of the two exceptions a bilateral sympathectomy had been done several months before. A study of the retinal circulation is suggested as an aid to early diagnosis and to following up the evolution of intracranial hypertension, and as of greater

help than lumbar puncture in the presence of subarachnoid block. Bailliart's technique in the sitting posture was employed. Gross sources of error, such as emotion, transitory vasomotor disturbances, local retinal angiopathies, and general arterial hypertension, must be guarded against by repeated observation and careful examination. The systolic arterial pressure was found too variable, and the venous pressure too difficult to apply and interpret, to be of value. When papilledema appears the retinal tension falls irrespective of intracranial tension.

M. Davidson.

Cucchia, A. **Clinical research on the etiology of thrombosis of the central vein.** Ann. di Ottal., 1928, v. 56, Aug., p. 710.

Thirty cases of venous thrombosis were studied and analyzed. In eight cases were found evidences of general arteriosclerosis, more or less markedly developed. Indeed arteriosclerosis occurred in two-thirds of the cases in association with other conditions, and next in frequency was chronic interstitial nephritis. Eight cases showed an excess of urea in the blood. In one case a lowering of vision was observed shortly after a contusion over the left frontoparietal region. Cucchia believes that the chronic nephritis, together with early arteriosclerosis, favored the trauma acting as a contributing cause of thrombus. Park Lewis.

De Salvati. **Retinal arterial pressure sitting or lying.** Ann. d'Ocul., 1928, v. 165, Dec., pp. 917-919.

The author found that there was no difference in the retinal arterial pressure dependent on whether the patient was sitting or recumbent. There was therefore a parallelism between the local and general arterial pressure in this regard.

Lawrence Post.

Dusseldorf, M. **Encapsulated hernia of vitreous after scleral puncture.** Arch. de Oft. de Buenos Aires, 1928, v. 3, Oct., p. 656.

A fifty-three-year-old woman devel-

oped severe glaucoma following thrombosis of the central vein of the retina. Wassermann reaction was positive, and she was receiving active antiluetic treatment. An Elliot trephining was first done, but as the increased tension and discomfort shortly returned, 0.5. c.c. of vitreous was aspirated through a needle. The tension later rose to 130 mm., and the eye was enucleated.

Four mm. from the ora serrata, at the point of scleral puncture, there was a small rounded ectasia, appearing somewhat like the filtering scar following a successful Elliot trephining. There was a distinct loss of scleral substance, one mm. in diameter, through which there had occurred a hernia of vitreous, subconjunctivally. This prolapsed portion was atypical in its staining reactions with haematoxylin and eosin, and showing zones of different color reactions, and in addition a distinct laminated structure. The choroid and retina apparently suffered no ill effects beyond the actual puncture, and they remained adherent to the edges of the scleral wound.

The author offers no explanation of the failure of cicatrization of so small a wound, beyond a conjecture that it may follow prolapse of choroidal pigment cells between the lips of the defect.

A. G. Wilde.

Fuchs, Ernst. **Displacement of the retina upon the choroid.** Graefe's Arch., 1928, v. 121, p. 339.

After softening of the eye in enucleation or after death, the retina either lies smoothly against the choroid or it forms folds, of which the most common is a small one at the fovea centralis. It was found that in normal eyes with a smooth fovea the inner and outer elements of the retina in the vicinity of the fovea, with rare exceptions, were directed obliquely toward the fovea. Thus the retina must have moved peripheralward upon the choroid. This must result from sudden softening of the eye at enucleation or after death,

when the retina fails to keep up with the choroid in shrinking. The narrow and deep fovea is the result of the contraction together of the central parts of the retina after shrinking together of the choroid. The narrow fovea is the middle stage between the normally smooth fovea and that elevated in a fold. A fold of the retina occurs at the fovea because the contracting choroid draws so strongly on the retina that the normal adhesion between choroid and retina is overcome and the thinnest part of the retina at the fovea is elevated in a fold. Retinal folds and deepening of the macula may also occur during life as the result of sudden softening of the eyeball by perforation of a corneal ulcer or by a severe blow on the eye. H. D. Lamb.

Incze, Anton. **Contributions to Scheerer's conception of the pathogenesis of thrombosis of the central retinal vein.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 204-211.

The left eye of a man aged sixty-four years was enucleated with a piece of the optic nerve, six millimeters long, on account of glaucoma after thrombosis of the central retinal vein.

Histological examination revealed that the clinical picture of occlusion of the central vein was caused not by thrombosis, but by a disease of the vascular wall, in consequence of which the lumen was reduced to 1/11 its original size. The fact that the inner layers of the wall of the central artery were very much thickened and the elastic fibers destroyed, with increase of connective tissue elements, supports Scheerer's view that the inclination to occlusion of the vein is influenced by pressure of the rigid artery.

C. Zimmermann.

Koyanagi, Y. **The significance of vascular crossing for origin of thrombosis of a branch of the retinal central vein.** Klin. M. f. Augenh., 1928, v. 81, pp. 219-231. (7 ill.)

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cases of thrombosis of a branch of the central retinal vein in patients between forty-three and fifty-five years of age. The thrombosis was most frequent in the upper temporal vein. Peripherally from the crossing of the vein by the apparently normal artery, numerous hemorrhages were encountered, due to stasis.

In the ophthalmoscopic examination of one half of the cases the author paid special attention to this, and he found that in none did this thrombosis of the branch occur without crossing by the artery. Six cases are described in detail and illustrated, one with histological examination. The mechanism of development may be explained by pressure of the artery, which at greater age regularly shows thickening of its walls independent of the presence of arteriosclerosis.

C. Zimmermann.

Mengel, Willard G. **Retinal disease with massive exudation: report of case.** Jour. Med. Soc. of New Jersey, 1928, v. 25, Dec., p. 788.

A boy aged six and a half years had for a year been unable to see well with the right eye. The fundus picture was characteristic. The boy had a suspicious tuberculous chest condition and an indefinite sinus lesion which Mengel considers coincidental. The condition was progressive, glaucoma developing after ten months observation and necessitating enucleation. A report on the eye is given by Dr. De Long, Wills Eye Hospital pathologist. Ralph W. Danielson.

Panico, E. **Alterations in thickness of the retina by physical and chemical stimuli.** Ann. di Ottal., 1928, v. 56, July, p. 642.

The author divides his studies in three parts:

- (1) changes produced in the retina by light (spectral and monochromatic) and darkness;
- (2) by the action of heat and cold;
- (3) by the action of certain poisons;

From experiments on the frog the

conclusions reached are those of Angelucci, that variations in thickness occur only in the pigmented epithelium, in the rods, and in the cones.

(1) Under exposure to white light after a period of darkness the reduction in thickness was about ten μ .

(2) There was displacement of the pigment toward the limitans externa.

(3) Under monochromatic light (red or green) there was a like displacement of pigment and a degree of thinning little inferior to that from white light. (4) The changes were only in the above mentioned triad. There was no appreciable alteration in the other retinal strata.

Similar changes were caused by heat and cold. Under the action of strychnine and eserine a diminution in the thickness of the retina was noted similar to that found under light. No eyeground changes resulted from the action of atropin.

Park Lewis.

Uyemura, Misao. **Peculiar fundus changes in two cases of idiopathic hemeralopia.** Klin. M. f. Augenh., 1928, v. 81, Oct., p. 471.

Two boys, aged fourteen and ten years respectively, suffering from idiopathic hemeralopia, showed a fine greyish-white opacity of the fundus with innumerable yellowish-white dots, except in the macular and circumpapillary regions. Under cod liver oil the dark adaptation of the first patient improved from the third day and the white dots gradually disappeared, being entirely gone by the fifty-seventh day. Probably they were located in the pigment layer and were due to avitaminosis.

C. Zimmermann.

Uyemura, Misao. **On the threshold value of the cones in idiopathic hemeralopia.** Klin. M. f. Augenh., 1928, v. 81, Aug.-Sept., pp. 186-189. (4 curves.)

Uyemura tested the light sense and measured the dark adaptation, by a new method of Kawakami, in nine cases of idiopathic hemeralopia, in which the main etiological moment

was ascribed to vitamin A deficiency. He found not only the function of the rods but also that of the cones disturbed, and assumes that hemeralopia is a common disorder of nutrition of both structures, a pathological condition of the visual purple.

C. Zimmermann.

II. OPTIC NERVE AND TOXIC AMBLYOPIAS

Bodenheimer, E., and Korbsch, H. **Clinico-anatomical contribution to the theory of pupillary fibers.** Graefe's Arch., 1928, v. 121, p. 46.

In a case of brain tumor a choked disc in the right eye resulted in optic atrophy and amaurosis, but with preservation of the light reaction. Histological examination after death demonstrated unaffected axis-cylinder processes in the dorsal part of the optic nerve. To explain the clinical findings, it must be admitted that normally there are differences in level between the stimulus threshold of the pupillary and visual centers. In other words, in the preserved axis-cylinder processes a centrally conducted stimulus might be sufficiently strong to produce a pupillary reaction when it no longer sufficed to cause a visual impression.

H. D. Lamb.

Chaillous, J. **Ocular syndrome of meningiomas at the cribriform plate.** Ann. d'Ocul., 1928, v. 165, Dec., pp. 881-892.

The literature of the subject is discussed and two cases of Cushing's with illustrations are cited in detail. One case of the author's is given. Suggestive points in differential diagnosis are loss of vision in both eyes without intraocular change, later optic atrophy in one eye and choked disc in the other. Occasionally disturbances of smell and general mental imbalance are present and there is often a suggestion of exophthalmus. Radiography may also prove suggestive. Retrobulbar neuritis is rarely bilateral and does not show the other signs of the above syndrome. Multiple sclerosis shows signs other than

ocular which are very suggestive of the disease.

Lawrence Post.

Coppez, H. **Examination of fundus in brain tumors.** Trans. Neurol. Congress, Paris, 1928, Rev. Neurol., 1928, 35th year, v. 2, July, pp. 133-134.

Papillitis of renal origin cannot be absolutely differentiated from that due to intracranial growth. A case is given in illustration: Therapeutic decompression is often of little avail in saving vision, because of the slowness of its effect. When simultaneous ventricular puncture is done the improvement in vision is often very rapid and may be manifest in a few hours. The hemiopic pupillary reaction is a valuable diagnostic aid if the test is properly performed; failure to demonstrate it and benefit by it is due to faulty technique. For the test the author advises (1) very small lamps, such as those of the electric ophthalmoscope, in order to avoid as much as possible the diffusion of light to the other side of the retina; (2) only enough illumination of the room to permit observation of the pupils; (3) placing the lamps as far as possible temporally to the right and left; and (4) the use of a switch to facilitate instantaneous turning on of the lamps simultaneously and successively on the two eyes. The procedure is repeated for each eye separately, during occlusion of the other eye, in order to rule out retinal incongruity in cases of hemianopsia due to a basal lesion. Absolute immobility of the pupil on the hemianopic side should not be demanded, but only a difference between the reactions of the two sides.

M. Davidson.

Dupuy-Dutemps. **The pathogenesis of papilledema.** Trans. Neurol. Congress, Paris, 1928, Rev. Neurol., 1928, 35th year, v. 2, July, pp. 138-140.

The author reiterates his adhesion to the theory of Deyl, that papilledema is due to compression by the cerebrospinal fluid of the central vein in its passage through the intervaginal space and dural sheath and not to

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strangulation of the optic nerve by the scleral ring. In proof of this, sections are exhibited showing distension of the intraneural part of the central vein and its flattened condition outside of the optic nerve. For the formation of papilledema there must be intracranial hypertension as well as free communication between the subarachnoid space and the intervaginal space. Blocking of the communication by plastic exudates would explain the absence of papilledema in acute and tuberculous meningitis, in spite of evidence of high degrees of intracranial hypertension, and unilateral blocking explains the cases of unilateral papilledema. A case is reported in which the papilledema disappeared with onset of meningitis following a gunshot wound, and which showed at autopsy a plastic exudate blocking the channel communication.

M. Davidson.

Guillain, George, and Lagrange, H. **Papilledema and cerebral tumors.** Trans. Neurol. Congress, Paris, 1928. Rev. Neurol., 1928, 35th year, v. 2, July, pp. 130-132.

Only fifteen out of twenty-eight cases of verified intracranial tumor at the Salpêtrière had given rise to papilledema, the others coming to a fatal termination without it. While the latter group had shown in general a lower intracranial tension than the former, there were some exceptions. From an analysis of their cases the authors feel justified in drawing the conclusion that basilar tumors do, and tumors involving the third ventricle do not, tend to produce papilledema, irrespective of the size and nature of the tumor.

M. Davidson.

Koyanagi, Y. **Once more on the development of caverns in the optic nerve of nonglaucomatous eyes.** Klin. M. f. Augenh., 1928, v. 81, Oct., pp. 499-507. (5 ill.)

A girl aged nineteen years sustained in a railway accident fractures of the

skull and lower jaw, with right exophthalmus, ulcer of the cornea, and subsequent pallor of the optic nerve and hypotension. At the patient's request the eye was removed after two months. The chief anatomical change consisted in cavernous atrophy of the optic nerve. The lamina cribrosa was normally situated, the canal of Schlemm normal, and the angle of the anterior chamber showed not the least glaucomatous alteration. The caverns are explained by partial avulsion of the optic fibers through stretching from the acute protrusion of the eyeball. *C. Zimmermann.*

Moscardi, P. **Visual field changes in tabetic optic atrophy.** Riv. Oto-Neuro-Oft., 1928, v. 5, July-Aug., pp. 345-374.

The visual fields of forty-two patients affected by tabes were examined and were found contracted for form and colors either irregularly or concentrically, the field for green being first affected, then that for other colors, and last the field for form. The changes were not symmetric or analogous in the two eyes. According to the author the defects proceed irregularly toward the center until perception for colors and form is entirely lost. A central scotoma either unilateral and bilateral was also found. It never was present in the initial stages of the field defects. When present it was either unilateral or bilateral with or without central scotoma, most frequently inferior or superior, in one case bitemporal, in no case binasal or homonymous. Central scotoma and hemianopsia are due to an irregular contraction of the visual fields of which they represent the advanced stage. Typical bilateral hemianopsia, when present, can be due to tabetic changes at the chiasm or to bilateral changes in the optic nerve. *M. Lombardo.*

12. VISUAL TRACTS AND CENTERS

Baruk, H. **Lilliputian hallucinations observed in connection with a**

hypophyseal tumor. Trans. Neurol. Congress, Paris, 1928. Rev. Neurol., 1928, 35th year, v. 2, July, pp. 75-77.

A case of hypophyseal tumor with postneuritic optic atrophy on the left and optic neuritis on the right side, a right temporal hemianopsia, and frequent attacks of Jacksonian epilepsy, is reported as exhibiting at intervals hallucinations of doll-like dressed and colored figures dancing and jumping in the hemianopic field of the right eye, this lasting twenty to thirty seconds in states of otherwise perfect lucidity. The author believes that a purely sensory hallucination of figures points to a direct irritation of the optic tract rather than to direct compression of the temporal lobe by the tumor, the resurrection of childhood memories being accomplished via the visual center in the occipital lobe. The phenomenon is suggested as a possible means of localization.

M. Davidson.

Magnus, Hans. Röntgen-ray of hypophyseal tumors. Graefe's Arch., 1928, v. 121, p. 225.

In thirty-four cases of tumor of the hypophysis, there were four with acromegaly, one with adiposo-genital dystrophy, four with hypogenitalism, four with adiposity, and twenty-one cases showing no general disturbance. Of twenty-two cases exposed to x-rays, in eleven, or fifty per cent, an improvement of vision occurred. The four cases with acromegaly and two with hypogenitalism were successfully treated with the rays. The general condition of these patients, however, showed no essential change.

H. D. Lamb.

Scalzitti, G. Behavior of the ciliary ganglion following extirpation of the superior cervical sympathetic ganglion. Ann. di Ottal., 1928, v. 56, July, p. 626.

The abundant literature concerning the ciliary ganglion in general attributes to this little nerve center a motor-sensory function of primary

importance in the mechanism controlling the photomotor and accommodative movements. This function has not always, however, been supported by experimental methods. Basing upon his experiments the author concludes that the ciliary ganglion is not purely sympathetic or spinal, but mixed sympathetic and spinal—sensory and motor. Like the lacrimal gland, which is affected at once and for several months after section of the sympathetic, at later periods the anatomical changes are scarcely appreciable, and from the physiological point of view the organ shows no alteration.

Park Lewis.

Triossi, S. Contribution to knowledge of the pupillo-palpebral reaction (Galassi-Westphal phenomenon). Riv. Oto-Neuro-Oft., 1928, v. 5, July-Aug., pp. 311-344.

Marked miosis follows forced contraction of the orbicularis palpebrarum muscle. The pupil regains its size as soon as the muscular tension is relieved. Graefe noticed this phenomenon in 1854. Galassi studied it in 1887 in two patients and called it the "pupillo-palpebral reaction". Westphal and Piltz published their work on the subject in 1899, and many other authors followed. Triossi has studied this reaction in 100 healthy persons with normal pupillary reactions, in 19 patients who showed the classic Argyll Robertson pupil, in 12 with incipient or complicated Argyll Robertson pupils, in 26 with partial or total internal ophthalmoplegia, and in 15 with pupils rigid and dilated in association with blindness due to optic nerve or retinal disease. The conclusions the author reaches follow: The pupillo-palpebral reaction is a purely physiologic fact. The reaction is less intense than the common pupillary reflexes. The reaction appears more intense in some pathologic conditions than in others, the highest intensity being shown by the classic Argyll Robertson pupils, the lowest by rigid pupils in relation to blindness due to optic nerve or retinal diseases. The

author rejects the so-called mechanical theory as to the production of the phenomenon and thinks that it is probably due to an associated action of the seventh with the third cranial nerve. As to the history, the precise dates above reported demonstrate that priority really belongs to Graefe and to Galassi. (Bibliography.)

M. Lombardo.

13. EYEBALL AND ORBIT

Atkinson, D., Lisser, H., and Shephardson, H. **Pronounced exophthalmos in a case of adenomatous goiter without hyperplasia.** *Endocrinology*, 1928, v. 7, Sept.-Oct., p. 680. The patient, a woman aged forty-one years, presented a marked exophthalmos, but was only mildly toxic, her basal metabolic rate being only 26.5 per cent plus. Skiagraphy and operation demonstrated an intrathoracic extension of the thyroid which pressed on the cervical sympathetic chain. Diagnosis of adenoma with no hyperplasia was confirmed by microscopic study. Removal of the adenoma relieved the exophthalmos and the slight toxicity.

R. W. Danielson.

Bichelonne, B. **Amelioration by ocular prosthesis of certain deformities of the lids.** *Bull. Soc. Français d'Opht.*, 1928, p. 124.

Bichelonne stresses the importance of a correctly fitting artificial eye. If it is too large, or above all if not adapted to the contours of the orbital cavity, the pressure exerted by the upper lid of the eye causes the lower lid to sag down and forward. The lower cul-de-sac becomes obliterated and the eye slides out. Most of these cases are ordinarily considered as surgical, but Bichelonne describes a method by which the socket can usually be restored even when apparently hopeless. He begins by inserting pieces molded to fit the individual socket, and then gradually increasing the volume and weight. As a result, the lower lid slowly regains its lost tonicity and the inferior cul-de-sac reforms, eventually reaching a stage at

which an artificial eye can be well retained.

Phillips Thygeson.

Dantrelle and Sheehan. **Orbital graft of cartilage from the ala nasi.** *Ann. d'Ocul.*, 1928, v. 165, Dec., pp. 902-909.

At the time of enucleation two curved strips of cartilage are removed from the ala nasi and are sewed into the orbit. Tenon's capsule and the muscles are secured above them. The advantage over most methods is that this is a simple autograft and therefore likely to take and to be less of a procedure than costal resection. Contraindications are where the eye is removed for sympathetic disease or where there is chronic nasal infection.

Lawrence Post.

Moscardi, P. **Considerations on phlegmon of the orbit.** *Riv. Oto-Neuro-Oft.*, 1928, v. 5, Sept.-Oct., pp. 398-417.

The author reports two cases of phlegmon of the orbit, giving a complete description of the clinical, pathologic, and post-mortem findings. In one case the phlegmon developed in the left orbit of a woman forty years of age, in the other one in the two orbits of a girl of five years. Beside the common local symptoms the two cases were characterized by very severe general symptoms, the first one being complicated with meningeal symptoms of extension of the infection to the endocranium, and the second with pulmonary and renal metastases. In the first case the infection started in the periorbital sinuses, in the second in the mucosa of the nasal cavities. *Staphylococcus aureus* and *albus* were found in the left nasal cavity and afterward in the purulent focuses in the left orbit. The germs had penetrated the orbit from the nasal mucosa through the ethmoidal vein. The author says that the left orbital cavity was first affected from the left nasal cavity and then the right orbit probably from the right nasal cavity. (Bibliography and sixteen figures.)

M. Lombardo.

Schöpfer, Otto. **Multiple tuberculoma of the orbit.** *Klin. M. f. Augenh.*, 1928, v. 81, Aug.-Sept., pp. 193-196. (1 ill.)

In an otherwise apparently healthy man of fifty-six years a tumor had developed under the right lower and one under the right upper lid, four weeks previously. The tumor of the lower lid was extirpated, and microscopic examination revealed undoubted tuberculosis. The tumor of the upper lid completely disappeared after roentgen radiation. As the patient never had had any eye affection and the conjunctiva was intact, the author assumed an endogenous metastasis.

C. Zimmermann.

Shelbourne, James T. **Orbital cellulitis following powder burn of conjunctiva: case report.** *Virginia Med. Monthly*, 1928, Nov., p. 548. The right eye of a boy aged fifteen years was only slightly burned by gunpowder in September 1923. Three weeks later, for two days he had severe pain over the right frontal sinus, followed by marked exophthalmos and redness of the lids. There had been no recent cold or infectious disease. Drainage made along the lower and upper orbital margin had resulted in complete and permanent restoration of position and function.

R. W. Danielson.

14. EYELIDS AND LACRIMAL APPARATUS

Albrich, Konrad. **Filiform keratitis and the secretion of the lacrimal gland.** *Graefe's Arch.*, 1928, v. 121, p. 402.

The author reports briefly the histological findings in the lacrimal glands of three cases of filiform keratitis, where Schirmer's test showed a diminution in the secretion of tears. In one case the greater part of the lacrimal gland was infiltrated with small lymphocytes as a manifestation of Mikulicz' disease, in another the secretory granules in the acini of the lacrimal gland were smaller than normal, due to arteriosclerosis, and in the

third case a cirrhotic part of the gland, also showed these small secretory granules.

H. D. Lamb.

Boente, Franz. **A new endonasal lamp for Toti's dacryocystorhinostomy.** *Klin. M. f. Augenh.*, 1928, v. 81, Aug.-Sept., 1928, pp. 286-289. (1 ill.)

The lamp has the shape of a rod, 10 cm. long and 0.6 cm. in diameter, is of lead glass, and has a fine metal filament. It can be sterilized. Introduced from the nose it gives an excellent illumination of the field of operation.

C. Zimmermann.

Cattaneo, D. **Plastic dacryocystorhinostomy with posterior flap.** *Riv. Oto-Neuro-Oft.*, 1928, v. 5, Sept.-Oct., pp. 418-433.

The author's method differs in some fundamental points from that of Dupuy-Dutemps. He resects the sac in its inferior extremity. The different form and site of osteotomy, as done by him, and reconstruction of the sac by suturing a rectangular flap of the nasal mucous membrane with the posterior margin of the sac, are said to give better guarantees for a good and permanent result. The advantages of this technique are that the suturing of the parts is easy and is done in such a way as to avoid occlusion of the new-formed sac cavity. The author practised this surgical process in thirty-two patients whose age varied from six to seventy years. He publishes also radiographs of cases showing the occlusion of the lacrimal passages before operation and the good result as disclosed by the escape of lipiodol into the nasal cavity. (Bibliography and nine figures.)

M. Lombardo.

Jeandelize, P., and Baudot, R. **Lacrimal autoplasty by dermoepidermal grafts.** *Bull. Soc. Franç. d'Opht.*, 1928, p. 110.

Jeandelize and Baudot describe in detail the technique of their operation for restoration of lacrimal drainage by means of skin grafts. The indications,

according to the authors, are traumatic section of the inferior canaliculus and unsuccessful dacryocystorhinostomy, due either to operative error or to closure of the canaliculi. Briefly, the operation consists of ten steps: (1) exposure of the sac by classic incision; (2) opening of sac, vertically; (3) exploration of nasolacrimal canal; (4) conjunctival section, behind and below the caruncle, opening into the lacrimal sac; (5) dermoepidermal graft, obtained from inner side of arm; (6) graft placed on a rubber drain, 3 mm. in diameter, raw surface out and sutured into position; (7) introduction of the graft into the conjunctival opening, extending either to the nasal canal or just to the sac; (8) fixation of the graft by conjunctival and lacrimal sutures; (9) suture of the cutaneous wound; (10) removal of the rubber drain at end of eight days. Of six cases operated three showed permanently good results. Two showed good initial results but could not be followed. One was entirely unsuccessful.

Phillips Thygeson.

15. TUMORS

✓ Balacco, F. **Epithelial papillomatous invasion of the anterior chamber.** *Ann. di Ottal.*, 1928, v. 56, Mar., pp. 250-255.

A woman sixty-five years of age showed a flesh-like, indolent mass of two years duration, implanted with a large base at the internal corneal limbus. It had a triangular shape and covered the nasal side of the eyeball from the plica semilunaris to the nasal third of the cornea. A similar smaller mass had been removed from the same place about seven years previously. The cornea showed a small perforation in the lower quadrant. The eye was enucleated and the clinical diagnosis of epithelial papilloma was confirmed by microscopic examination of the tumor. The thick superficial part of the tumor presented the aspect that characterizes the normal epithelium of that region. The thick layer of the epithelium through

the corneal perforation penetrated the anterior chamber and lined the posterior surface of the cornea, the tissue of the angle, and the anterior surface of the iris. This membrane showed the same papillomatous structure as the external mass. Bibliography, two figures in the text, and three photomicrographs.

M. Lombardo.

Cucchia, A. **Contribution to the study of tumors of the pars ciliaris retinae.** *Ann. di Ottal.*, 1928, v. 56, July, p. 577.

The case of ciliary neoplasm reported by Cucchia occurred in a child four years of age. The left globe appeared to be increased in volume. It was mobile in the orbit, and closure of the palpebral fissure was incomplete. The conjunctival and episcleral vessels were markedly dilated. In the inferior section of the anterior portion of the eye was found a fleshy growth of lumpy formation reaching to the limbus. The cornea was transparent, but reaching to it was a mass of whitish color, partly gray, which occupied the larger portion of the anterior chamber. The upper third of the sclerocorneal limbus was bordered by a brown crescent that had the appearance of a staphylomatous zone. There was a slight reduction in tension. After enucleation, microscopic examination demonstrated a neoplasm which occupied the posterior chamber and almost the whole of the anterior chamber. The structure of the mass had the appearance of the normal elements greatly increased in quantity. The inner zone in the neighborhood of the ciliary processes was made up of cylindrical cells deposited in rows sometimes complete and sometimes incomplete around spaces of varying dimensions. (Wintersteiner rosettes). Within the cavity were degenerated cells. Distinctive also was the scarcity of blood vessels.

The author summarizes the cases already reported. *Park Lewis.*

Favaloro, G. **On the comparative morphology of the normal and neuroplastic neuroglia in glioma of the optic nerve in man.** *Ann. di Ottal.*, v. 1928, v. 56, July, p. 619.

The complexity and the uncertainty concerning human neuroglia led the author to make a series of comparative studies of the glia in animals from the embryological viewpoint, following varied methods and using sections from different parts of the cerebrospinal system. He concludes that we must reject the common oncological concept that optic nerve tumors are developed from the neuroglia in adult life, they being on the contrary histologically and hystogenetically of embryonic origin.

Park Lewis.

✓ Heymans, Joseph. **Papilloma or "cancroid"?** *Arch. d'Ophth.*, 1929, v. 46, Jan., p. 48.

A patient sixty-five years of age showed a cauliflower growth at the limbus. The growth was about the size of a bean and of a gray-red color, vascular, extended on to the cornea, and was attached by a large pedicle. There was no submaxillary or preauricular glandular enlargement. The growth was shaved off the globe and the stump cauterized. There is a detailed report of the histologic examination which led to a diagnosis of papilloma or mildly malignant epithelioma ("cancroid"). The only way to establish the malignancy would be if there was recurrence with invasion of the globe. Recurrence without invasion would indicate papilloma. The case was presented to demonstrate the impossibility of deciding at times between papilloma and "cancroid." When in doubt the growth should be excised and one should wait for invasive recurrence before doing enucleation.

M. F. Weymann.

✓ Luppino, G. **Clinical observations on the pathological anatomy of palpebral endothelioma.** *Ann. di Ottal.*, 1928, v. 56, Aug., p. 744.

In an infant born at full term two small red tumefactions were discovered on the upper lid of the left eye. At the end of a month these had increased in size and had fused into one. When the child was three months old a treatment by radiocoagulation was employed, and the red color disappeared but the growth increased in size. Some time later the globe and adnexa were found not affected, but the tumefaction reached the superior border of the orbit, covering the entire ball. The tumor was soft and elastic, adhering lightly to the skin beneath which it could be felt. The color of the skin was normal. Exploratory puncture brought out a few drops of blood.

A diagnosis of angiosarcoma was made. To limit the tumefaction four treatments were given with the electric needle, producing a zone of healthy tissue. The tumor was then excised. At every point muscle and nerve fibers were found mingled with the blastodermic tissue.

The sarcomata of the vessel walls constitute histologically a group whose microscopic appearance is so variable that they cannot be described in a few words. They have the following characteristics: infiltrative development with substitution of tissue; metastases rare; external appearances varied; matrix formed of endothelioma or more specially hemangioma and lymphangioendothelioma. The term angiosarcoma is applied only to those of the cavernous type.

Park Lewis.

Luppino, G. B. **Clinical and histopathological contribution to incipient melanosis of the choroid, with special reference to the ophthalmoscopic picture.** *Ann. di Ottal.*, 1928, v. 56, July, p. 612.

The author had an opportunity to follow the development of the neoplasm from its incipency to the time of enucleation. Subjective and objective symptoms were compared with

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the pathological findings. When first discovered the growth was not larger than a small pea. It lay at the anterior part of the choroid near its junction with the ciliary body, and so attained a relatively considerable size before the vision was sufficiently affected to call attention to its presence.

The points of diagnostic importance were absence of any opacity in the vitreous, and absence of changes in the surrounding tissues, except a patch of opacity in the retina before the inevitable detachment at the position of the tumor. Transillumination showed complete opacity over the zone occupied by the neoplasm.

Park Lewis.

Pokrovski, A. I. **On the diagnosis of sarcoma of the choroid.** *Russkii Opt. Jour.*, 1928, Dec., pp. 679-684.

Meisner's method of removing some subretinal fluid in cases of suspected choroidal tumor, for microscopic search for tumor cells after fixation and staining, is criticized by the author because of the danger of implanting sarcoma cells into surrounding tissues. The following precautions are advocated: (1) preliminary removal of a piece of conjunctiva at the site of the scleral puncture; (2) cauterization after the scleral puncture; (3) when the result of the puncture is positive immediate enucleation with subsequent radiation.

M. Beigelman.

NEWS ITEMS

News items in this issue were received from Drs. F. L. Beck, Cheyenne, Wyoming; C. A. Clapp, Baltimore; Gaylord C. Hall, Louisville, Kentucky; M. Paul Motto, Cleveland; Carl M. Oberg, Minneapolis; G. Oram Ring, Philadelphia; and F. L. Wicks, Valley City, North Dakota. News items should reach **Dr. Melville Black**, Metropolitan building, Denver, by the twelfth of the month.

Deaths

Professor Filippo Speciale-Cirincione, of the University of Turin, died at Turin on January 19, 1929, aged forty-seven years. Professor Speciale-Cirincione had been particularly active as a collaborator of the *Annali di Ottalmologia e Clinica Oculistica*, for which he regularly abstracted a number of foreign publications, including the *American Journal of Ophthalmology*.

Miscellaneous

In Connecticut, senate bill 24 amends the present law relating to optometrists by requiring attendance for three years in a school of optometry, and by limiting the use of the word "doctor" to the appending of the letters "O.D."

The February issue of the *Journal of the Medical Association of Georgia* publishes an eloquent tribute to Dr. Abner Calhoun, delivered by Dr. G. E. de Schweinitz as an introduction to the Abner Calhoun lecture.

"The World Tomorrow" for March, 1929, contains an article by Dr. Thomas Hall Shastid of Duluth, Minnesota, in favor of a proposed amendment to the constitution of the United States providing for a "war-check vote", that is to say, requiring that if congress votes in favor of an extraterri-

torial war the question must at once be referred to a popular vote.

The Italian government has prohibited the sale of spectacle lenses in stores which do not specialize in this class of merchandise. Viva Mussolini! At a recent meeting of the French Society of Opticians the advisability of promulgating a similar regulation in France was discussed.

An article by Dr. Thomas Hall Shastid in "The Nation", February 20, 1929, entitled "My father knew Lincoln" dwells especially on the peculiarity of Lincoln's physiognomy. The left eye from time to time looked queer and then suddenly "crossed", that is turned up. Dr. Shastid believes that this weakness of the ocular muscles probably explains Lincoln's well known depression of spirits, for which more romantic causes are ordinarily assigned. Dr. Shastid also recalls quoted remarks about Lincoln that may indicate that he was color-blind.

Societies

Dr. Sanford Gifford, of Omaha, addressed the Chicago Ophthalmological Society, February 19, on sympathetic ophthalmia. Dr. Cyrus W. Rutherford of Iowa City addressed the same meeting on "complications in cataract extraction".

The February meeting of the Colorado Ophthalmological Society, held at the University Club, Denver, was a dinner meeting. The usual presentation of patients was omitted, and instead Dr. Edward Jackson gave an after-dinner talk on "Ophthalmological experiences of a lifetime".

The mid-year meeting of the North Dakota Academy of Ophthalmology and Otolaryngology was held at the Chamber of Commerce in Fargo on February 9, under the presidency of Dr. A. T. Bailey of Jamestown. The meeting was largely attended and much interest was evidenced in the program furnished. Dr. G. J. Gislason, Grand Forks, presented a paper on sympathetic ophthalmia. Dr. Frank E. Burch, Saint Paul, delivered an illustrated lecture on the correction of ptosis. The subjects under consideration were widely discussed. Three men were voted to membership in the Academy at this meeting.

The section on ophthalmology of the College of Physicians of Philadelphia met Thursday, February 21, when the following program was given: Dr. Abner R. Renninger, by invitation, "Bilateral acute tubercular choroiditis", with exhibition of case; Dr. Warren S. Reese, "Divergence paralysis", with exhibition of case; Dr. George Schwarzkopf, by invitation, "A case of pulsating exophthalmus of long standing"; Dr. Frederick H. Leavitt, by invitation, "Schilder's disease"; Dr. Joseph C. Yaskin, by invitation, "Spontaneous nystagmus, some practical clinical features, especially their occurrence with diplopia". At the meeting of the section on Thursday evening, March 21, the program was as follows: Dr. George H. Cross, "Cilium in the anterior chamber for twenty years", with exhibition of case; Dr. Alan C. Woods of Baltimore, by invitation, "Investigations on the crystalline lens"; Dr. Arnold Knapp of New York City, by invitation, "Intracapsular operation after preliminary subluxation with capsule forceps"; Dr. Luther C. Peter, "Important phases of a satisfactory senile cataract extraction".

Dr. Conrad Berens, New York City, and Dr. Harry Gradle, Chicago, presented papers at the ophthalmological section of the Baltimore City medical society on February 28.

The organization group of the Cleveland Ophthalmological Society, at a dinner meeting at the University Club, February 12, discussed the necessity and advisability of forming a separate ophthalmic society. Dr. A. B. Bruner was appointed temporary chairman, and Dr. Paul G. Moore temporary secretary. The formation of such a society, it was brought out, would in no way conflict with the aims of the present ophthalmological and otolaryngological section of the Academy of Medicine; but the time is oppor-

tune to organize a society of men interested in the study of diseases of the eye. It is intended that the society shall be restricted in active membership to those who are thoroughly qualified by training and practice and who are interested enough to lend active and not merely passive support; and that the meetings shall be few in number but well organized, sufficient dues being charged to provide good meals, good speakers, and pleasant assembly rooms. The first regular meeting, at which the permanent officers were to be elected, was arranged for Tuesday, April 2, with Dr. Clarence King of Cincinnati as the guest of honor.

The forty-second congress of the French Ophthalmological Society will be held at Paris, in the Faculty of Medicine, on May 13, 1929, and following days. Inquiries should be addressed to the secretary, Dr. René Onfray, 6 avenue de la Motte Picquet, Paris VII^{me}.

Personals

Dr. Carl M. Oberg has returned to Minneapolis after five months in Europe, three months of which were spent in the Vienna eye clinics.

Dr. W. E. Bruner of the ophthalmological division of Lakeside hospital has been away for a six weeks' holiday in Florida.

Dr. Carson E. Hunt of Omaha has located in Laramie, Wyoming. He will limit his practice to diseases of the eye, ear, nose, and throat.

Dr. George L. Strader, Mrs. Strader, and daughter Lillian of Cheyenne, Wyoming, spent February and March in an automobile tour of New Mexico and Arizona.

Dr. William H. Wilmer of Baltimore recently returned from his winter vacation at Camden, South Carolina.

Dr. and Mrs. S. G. Dabney spent the month of March in California.

Dr. Will R. Pryor, former house surgeon of the Brooklyn Eye and Ear hospital, has returned after a year in Vienna, and is now associated with Dr. Gaylord C. Hall, 705 Brown building, Louisville, Kentucky.

Dr. W. C. Finnoff of Denver was operated upon for appendicitis in the early part of March. He has made a rapid and uneventful recovery.

Professor Maggiore, head of the ophthalmic clinic of Sassari (Sicily), recently declined an appointment to the more noted and more remunerative professorship in the university of Bari, in order that he might complete a work on trachoma which he has been preparing for the coming International Ophthalmological Congress. The Council of the Sassari university adopted a resolution expressing the faculty's appreciation of the self-sacrificing stand which Professor Maggiore had taken.